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**3RD GENERATION  
PARTNERSHIP  
PROJECT 2  
"3GPP2"**

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# Signaling Test Specification for EUTRAN- cdma2000 Connectivity and Interworking

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1 Revision History

<b>Revision</b>	<b>Description Of Changes</b>	<b>Date</b>
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Rev 0 v2.0	Point Release for bug fixes	July 2011

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**FOREWORD****(This foreword is not part of this specification)**

This specification was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This specification is the second version of the document and provides the signaling conformance and interoperability requirements for C.S0087-0 (Interworking of cdma2000 1X High Rate Packet Data and Long Term Evolution Systems) and X.S0057-0 (E-UTRAN - eHRPD Connectivity and Interworking: Core Network Aspects).

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**REFERENCES**

1 This section provides references to other specifications and standards that are necessary to  
2 implement this document.

3  
4 The following standards contain provisions which, through reference in this text, constitute  
5 provisions of this Standard. At the time of publication, the editions indicated were valid. All  
6 standards are subject to revision, and parties to agreements based on this Standard are  
7 encouraged to investigate the possibility of applying the most recent editions of the  
8 standards indicated below.

- 9 1. **3GPP2:** C.S0038-B v1.0, *Signaling Conformance Specification for High Rate Packet*  
10 *Data Air Interface.*
- 11 2. **3GPP2:** C.S0087-0 v2.0, *E-UTRAN – cdma2000 Connectivity and Interworking: Air*  
12 *Interface Specification.*
- 13 3. **3GPP2:** X.S0057-0 v1.0, *E-UTRAN - eHRPD Connectivity and Interworking: Core*  
14 *Network Aspects.*
- 15 4. **3GPP2:** C.S0015-B v2.0, *Short Message Service (SMS) for Wideband Spread*  
16 *Spectrum Systems.*
- 17 5. **3GPP2:** C.S0081-0 v1.0, *Signaling Conformance Specification for cdma2000 High*  
18 *Rate Packet Data Supplemental Services.*
- 19 6. **3GPP2:** C.S0024-B v3.0, *cdma2000 High Rate Packet Data Air Interface*  
20 *Specification.*
- 21 7. **3GPP2:** C.S0063-0 v2.0, *cdma2000 High Rate Packet Data Supplemental Services.*
- 22 8. **3GPP2:** C.S0005-D v2.0, *Upper Layer (Layer 3) Signaling Standard for cdma2000*  
23 *Spread Spectrum Systems.*
- 24 9. **3GPP:** TS 36.331 *Radio Resource Control; Protocol Specification (Release 8)*  
25

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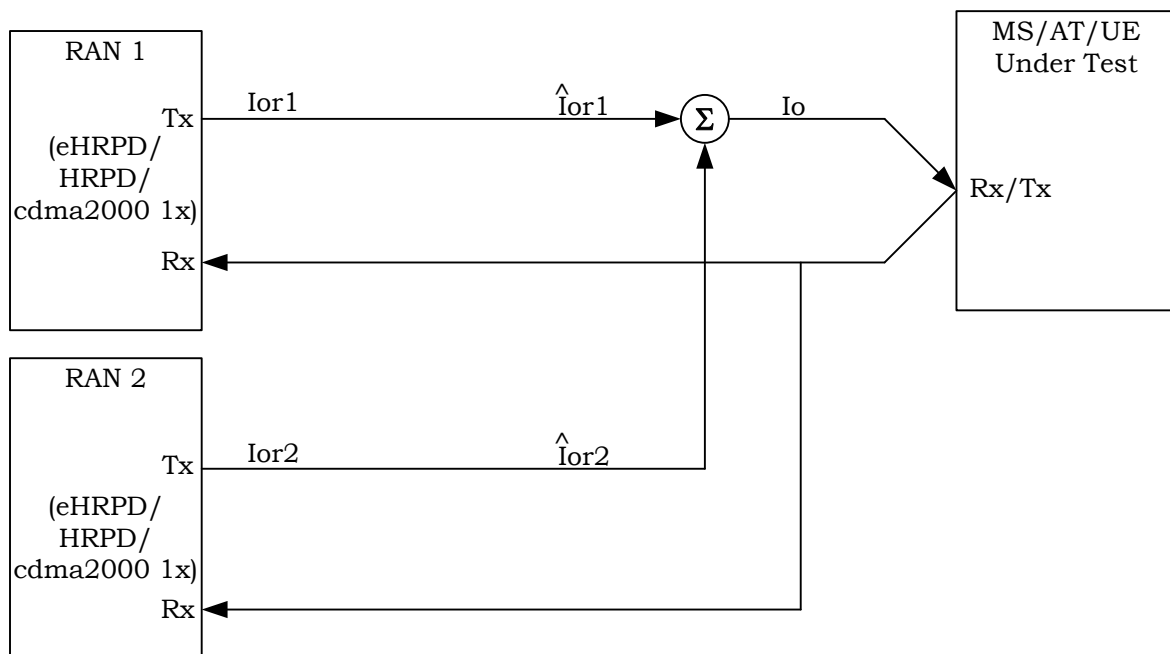
# 1 Introduction

## 1.1 Scope

This specification defines signaling conformance and interoperability tests for CDMA infrastructure and mobile stations using eHRPD and interworking of eHRPD with HRPD, cdma2000<sup>®</sup> 1x and E-UTRAN systems.

## 1.2 Test Setup

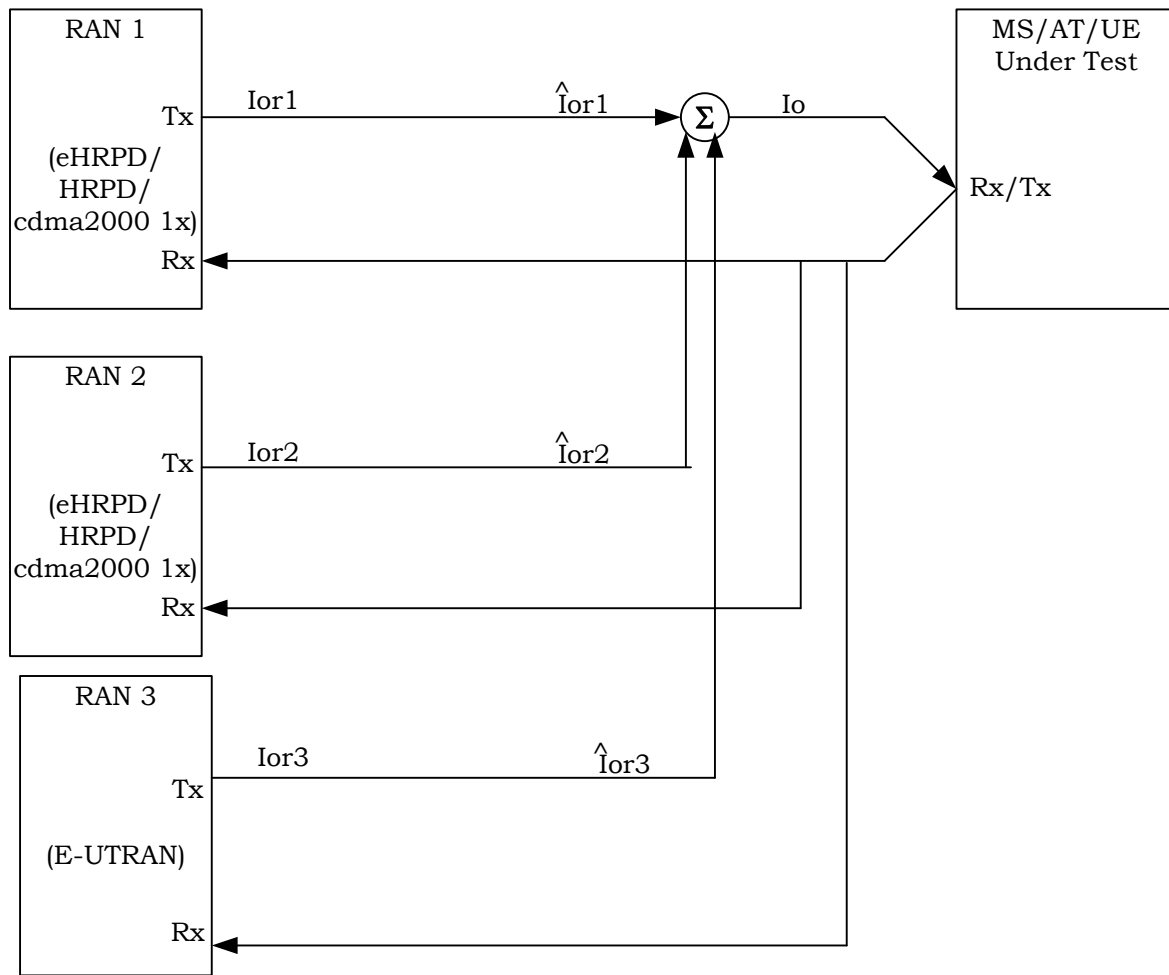
The typical test set-up required for the test is shown below.



**Figure 1 – Test Setup with two Radio Access Networks**

*cdma2000<sup>®</sup> is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000<sup>®</sup> is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.*

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**Figure 2 – Test Setup for mobility between E-UTRAN and eHRPD**

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4

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## 2 Conformance and Interoperability Tests

### 2.1 Session Negotiation Tests

#### 2.1.1 Introduction

Tests included in this section verify that the Access Terminal (AT) advertises its eHRPD capability to the eHRPD network during session negotiation and accepts the protocols and parameters to support eHRPD session.

#### 2.1.2 Session Negotiation with eHRPD Access Network

##### 2.1.2.1 Definition

This test verifies that the AT advertises eHRPD capability to the network during session negotiation and that this capability is successfully negotiated between the access terminal and the eHRPD network.

##### 2.1.2.2 Traceability:

[2]

Section 2.3	Packet Application Negotiation
Section 3.1	Additional Requirement to support eHRPD operation

[6]

Section 6.2.6.1.2	Processing the SessionClose Message
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[7]

Section 2.9.2.5	ATSupportedFlowProtocolParametersPP attribute
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##### 2.1.2.3 Test Procedure

- a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.
- b. If the AT has an open session with the RAN:
  1. Instruct the RAN to send a *SessionClose* message to the AT.
  2. Ensure that the AT sends a *SessionClose* message to the RAN.
- c. Ensure that the AT has an eHRPD IMSI and credentials (authentication keys) provisioned.
- d. Cause the AT to negotiate a new session with the RAN.
- e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

- 1 f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the
- 2 *ConfigurationRequest* message.
- 3 g. Verify that the AT does not propose Alternate EMPA bound to service network
- 4 (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.
- 5 h. Verify that the AT proposes DPA (0x0002), MPA (0x0005), EMPA (0x0009), and
- 6 optionally MMPA (0x000D) bound to the service network in the *ConfigurationRequest*
- 7 message for the stream protocol.
- 8 i. Ensure that the RAN accepts the EMPA bound to service network (0x0009) in the
- 9 *ConfigurationResponse* message for the stream protocol.
- 10 j. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the
- 11 ATSupportedFlowProtocolParametersPP attribute of EMPA.
- 12 k. Ensure that the RAN proposes a value of 0x07 for the ProtocolID field of the
- 13 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev
- 14 attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.
- 15 l. Verify that the AT accepts a value of 0x07 for the ProtocolID field of the
- 16 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev
- 17 attributes of the EMPA Link Flow bound to ReservationLabel 0xFF as proposed by
- 18 the RAN.
- 19 m. Verify that the AT is able to successfully complete the session negotiation.
- 20 n. Cause the AT to start a packet data call and establish a connection with the RAN.
- 21 o. Verify that the AT is able to successfully send and receive data using
- 22 ReservationLabel 0xFF.

#### 23 2.1.2.4 Minimum Standard

24 The AT shall comply with steps e, g, h, j, l, m and o.

#### 25 2.1.3 Session Negotiation with HRPD Access Network

##### 26 2.1.3.1 Definition

27 This test verifies that the AT advertises eHRPD capability to the RAN during session  
28 negotiation and that session negotiation proceeds when this capability is not negotiated by  
29 the HRPD RAN.

##### 30 2.1.3.2 Traceability:

31 [2]

32 Section 2.3 Packet Application Negotiation

33 Section 3.1 Additional Requirement to support eHRPD operation

34 [6]

35 Section 6.2.6.1.2 Processing the SessionClose Message

1 [7]

2 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

3 2.1.3.3 Test Procedure

- 4 a. Ensure that HRPD system is available to the AT and E-UTRAN system is unavailable  
5 to the AT.
- 6 b. If the AT has an open session with the RAN:
- 7 1. Instruct the RAN to send a *SessionClose* message to the AT.
- 8 2. Ensure that the AT sends a *SessionClose* message to the RAN.
- 9 c. Ensure that the AT has an eHRPD IMSI and credentials (authentication keys)  
10 provisioned.
- 11 d. Cause the AT to negotiate a new session with the RAN.
- 12 e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA  
13 (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to  
14 the service network for the ATSupportedApplicationSubtype attribute in the  
15 *ConfigurationRequest* message for SCP configuration.
- 16 f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the  
17 *ConfigurationRequest* message.
- 18 g. Verify that the AT does not propose Alternate EMPA bound to service network  
19 (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.
- 20 h. Ensure that the RAN accepts any application subtype other than Alternate EMPA  
21 bound to service network (0xFFFE) in the *ConfigurationResponse* message for the  
22 stream protocol. Note, the default behavior of the RAN will always follow this step as  
23 the AT should not propose Alternate EMPA in step g.
- 24 i. Ensure that the RAN does not propose a value of 0x07 or 0x08 for the ProtocolID  
25 field of the FlowNNFlowProtocolParametersFwd and  
26 FlowNNFlowProtocolParametersRev attributes of the Link Flow bound to  
27 ReservationLabel 0xFF.
- 28 j. Verify that the AT is able to successfully complete the session negotiation.
- 29 k. Cause the AT to start a packet data call and establish a connection with the RAN.
- 30 l. Verify that the AT is able to successfully send and receive data using  
31 ReservationLabel 0xFF.

32 2.1.3.4 Minimum Standard

33 The access terminal shall comply with steps e, g, j and l.

1 2.1.4 ProtocolID 0x08 Negotiation during Session Establishment with eHRPD Access  
2 Network

3 2.1.4.1 Definition

4 This test verifies that if the AT supports ProtocolID value of 0x08, then the AT advertises  
5 this capability during session establishment. Further, it also verifies that if the AN  
6 negotiates ProtocolID value of 0x08 for the FlowNNFlowProtocolParametersRev attribute of  
7 the link flow bound to ReservationLabel 0xFE, then the AT accepts this value and can send  
8 data for ReservationLabel 0xFE using this link. The test also verifies that data for other  
9 ReservationLabels other than 0xFF can be sent using the same link flow to which  
10 ReservationLabel 0xFE is bound. This test is not mandatory for the ATs.

11 2.1.4.2 Traceability:

12 [2]

13 Section 2.3 Packet Application Negotiation

14 Section 3.1 Additional Requirement to support eHRPD operation

15 [6]

16 Section 6.2.6.1.2 Processing the SessionClose Message

17 [7]

18 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

19 2.1.4.3 Test Procedure

20 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
21 unavailable to the AT.

22 b. If the AT has an open session with the RAN:

23 1. Instruct the RAN to send a *SessionClose* message to the AT.

24 2. Ensure that the AT sends a *SessionClose* message to the RAN.

25 c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
26 provisioned.

27 d. Cause the AT to negotiate a new session with the RAN.

28 e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA  
29 (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to  
30 the service network for ATSupportedApplicationSubtype attribute in the  
31 *ConfigurationRequest* message for SCP configuration.

32 f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the  
33 *ConfigurationRequest* message.

34 g. Verify that the AT does not propose Alternate EMPA bound to service network  
35 (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.

- 1 h. Verify that the AT proposes DPA (0x0002), MPA (0x0005), EMPA (0x0009), and  
 2 optionally MMPA (0x000D) bound to the service network in the *ConfigurationRequest*  
 3 message for the stream protocol.
- 4 i. Ensure that the RAN accepts the EMPA bound to service network (0x0009) in the  
 5 *ConfigurationResponse* message for the stream protocol.
- 6 j. Verify that the AT includes a value of 0x07 and 0x08 for the ProtocolSupported field  
 7 in the ATSupportedFlowProtocolParametersPP attribute of EMPA.
- 8 k. Ensure that the RAN proposes the a value of 0x08 for the ProtocolID field of the  
 9 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
 10 attributes of the EMPA Link Flow bound to ReservationLabel 0xFE. Ensure that the  
 11 link flow is active.
- 12 l. Instruct the AN to map ReservationLabel other than 0xFF to the same link flow to  
 13 which ReservationLabel 0xFE is mapped.
- 14 m. Verify that the AT accepts the value of 0x08 for the ProtocolID field of the  
 15 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
 16 attributes of the EMPA Link Flow bound to ReservationLabel 0xFE as proposed by  
 17 the RAN.
- 18 n. Verify that the AT is able to successfully complete the session negotiation.
- 19 o. Cause the AT to start a packet data call and establish a connection with the RAN.
- 20 p. Verify that the AT is able to successfully send and receive data for ReservationLabel  
 21 0xFE.

#### 22 2.1.4.4 Minimum Standard

23 The AT shall comply with steps e, g, h, j, m, n, and p.

#### 24 2.1.5 MMPA based eHRPD Personality Negotiation with eHRPD Access Network

##### 25 2.1.5.1 Definition

26 This test is only applicable to ATs that support MMPA based eHRPD operation. The test  
 27 verifies that the AT accepts personalities based on MMPA packet application.

##### 28 2.1.5.2 Traceability:

29 [2]

30 Section 2.3 Packet Application Negotiation

31 Section 3.1 Additional Requirement to support eHRPD operation

32 [6]

33 Section 6.2.6.1.2 Processing the SessionClose Message

34 [7]

## 1           Section 2.9.2.5                    ATSupportedFlowProtocolParametersPP attribute

## 2   2.1.5.3 Test Procedure

- 3       a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
4       unavailable to the AT.
- 5       b. If the AT has an open session with the RAN:
- 6           1. Instruct the RAN to send a *SessionClose* message to the AT.
- 7           2. Ensure that the AT sends a *SessionClose* message to the RAN.
- 8       c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
9       provisioned.
- 10      d. Cause the AT to negotiate a new session with the RAN.
- 11      e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE),  
12      Alternate MMPA (0xFFFC), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and MMPA  
13      (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute  
14      in the *ConfigurationRequest* message for SCP configuration.
- 15      f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the  
16      *ConfigurationRequest* message.
- 17      g. Verify that the AT includes MMPA bound to the service network (0x000D) in the  
18      proposed application subtypes in the *ConfigurationRequest* message for the stream  
19      protocol and excludes Alternate MMPA bound to service network (0xFFFC) in the  
20      proposed application subtypes in the *ConfigurationRequest* message for the stream  
21      protocol.
- 22      h. Instruct the RAN to accept MMPA bound to service network (0x000D) in the  
23      *ConfigurationResponse* message for the stream protocol.
- 24      i. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the  
25      ATSupportedFlowProtocolParametersPP attribute of MMPA.
- 26      j. Ensure that the RAN proposes the a value of 0x07 for the ProtocolID field of the  
27      FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
28      attributes of the MMPA Link Flow bound to ReservationLabel 0xFF.
- 29      k. Verify that the AT accepts the value of 0x07 for the ProtocolID field of the  
30      FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
31      attributes of the MMPA Link Flow bound to ReservationLabel 0xFF as proposed by  
32      the RAN.
- 33      l. Verify that the AT is able to successfully complete the session negotiation.
- 34      m. Cause the AT to start a packet data call and establish a connection with the RAN.
- 35      n. Verify that the AT is able to successfully send and receive data using  
36      ReservationLabel 0xFF.

1 2.1.5.4 Minimum Standard

2 The AT shall comply with steps e, g, i, k, and n.

3 2.1.6 Switching between MMPA and EMPA based eHRPD Personality

4 2.1.6.1 Definition

5 This test is only applicable to ATs that support MMPA based eHRPD operation. The test  
6 verifies that the AT is able to switch between EMPA and MMPA based eHRPD personality.

7 2.1.6.2 Traceability:

8 [2]

9 Section 2.3 Packet Application Negotiation

10 Section 3.1 Additional Requirement to support eHRPD operation

11 [6]

12 Section 6.2.6.1.2 Processing the SessionClose Message

13 [7]

14 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

15 2.1.6.3 Test Procedure

16 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
17 unavailable to the AT.

18 b. If the AT has an open session with the RAN:

19 1. Instruct the RAN to send a *SessionClose* message to the AT.

20 2. Ensure that the AT sends a *SessionClose* message to the AN.

21 c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
22 provisioned.

23 d. Cause the AT to negotiate a new session with the RAN.

24 e. Ensure that the AT includes Application Subtypes Alternate EMPA (0xFFFE),  
25 Alternate MMPA (0xFFFC), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and MMPA  
26 (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute  
27 in the *ConfigurationRequest* message for SCP configuration.

28 f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the  
29 *ConfigurationRequest* message.

30 g. Verify that the AT includes EMPA bound to the service network (0x0009) in the  
31 proposed application subtypes in the *ConfigurationRequest* message for the stream  
32 protocol and excludes Alternate EMPA bound to service network (0xFFFE) in the  
33 proposed application subtypes in the *ConfigurationRequest* message for the stream  
34 protocol.

- 1 h. Instruct the RAN to accept EMPA bound to service network (0x0009) in the  
2 *ConfigurationResponse* message for the stream protocol.
- 3 o. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the  
4 ATSupportedFlowProtocolParametersPP attribute of EMPA.
- 5 p. Ensure that the RAN proposes the a value of 0x07 for the ProtocolID field of the  
6 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
7 attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.
- 8 i. Verify that the AT sends a *ConfigurationResponse* message and accepts the value of  
9 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and  
10 FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to  
11 ReservationLabel 0xFF as proposed by the RAN.
- 12 j. After the AT responds to the RAN initiated *ConfigurationRequest* messages, instruct  
13 the AN to send a *SoftConfiguratonComplete* message with Continue field set to '1'.
- 14 k. Verify that the AT includes MMPA bound to the service network (0x000D) in the  
15 proposed application subtypes in the *ConfigurationRequest* message for the stream  
16 protocol and excludes Alternate MMPA bound to service network (0xFFFC) in the  
17 proposed application subtypes in the *ConfigurationRequest* message for the stream  
18 protocol.
- 19 l. Instruct the RAN to accept MMPA bound to service network (0x000D) in the  
20 *ConfigurationResponse* message for the stream protocol.
- 21 m. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the  
22 ATSupportedFlowProtocolParametersPP attribute of MMPA.
- 23 n. Instruct the RAN to accept MMPA bound to service network (0x000D) in the  
24 *ConfigurationResponse* message for the stream protocol for this personality.
- 25 o. Verify that the AT sends a *ConfigurationResponse* message and accepts the value of  
26 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and  
27 FlowNNFlowProtocolParametersRev attributes of the MMPA Link Flow bound to  
28 ReservationLabel 0xFF as proposed by the RAN.
- 29 p. Ensure that the RAN sends a *SoftConfiguratonComplete* message with Continue field  
30 set to '0' and that EMPA based personality is in use.
- 31 q. Cause the AT to start a packet data call and establish a connection with the RAN.
- 32 r. Verify that the AT is able to send and receive data using ReservationLabel 0xFF.
- 33 s. Instruct the RAN to switch the personality of the AT from EMPA to MMPA based  
34 personality.
- 35 t. Repeat steps q-r.

36 2.1.6.4 Minimum Standard

37 The AT shall comply with steps g, o, i, k, m, o, and r.

## 2.2 Session Configuration Tests for Dormant Mobility between eHRPD and HRPD

### 2.2.1 Introduction

Tests included in this section verify that when the AT moves across eHRPD and HRPD RAN boundary, the AT and the RAN negotiate attributes needed for operation in target eHRPD or HRPD RAN. Note, IP continuity will not be maintained during mobility between eHRPD and HRPD networks.

### 2.2.2 Dormant eHRPD to HRPD mobility with eHRPD to HRPD personality switch occurring in response to ConnectionRequest

#### 2.2.2.1 Definition

This test verifies that the AT is able to switch between eHRPD and HRPD capable personalities. Specifically, it is verified that the AT switches to the HRPD personality when the HRPD network switches the personality upon receiving a *ConnectionRequest* message from the AT. The PPP renegotiation and the QoS related changes for this scenario will be tested separately.

#### 2.2.2.2 Traceability:

[2]

Section 2.3 Packet Application Negotiation

Section 3.1 Additional Requirement to support eHRPD operation

[6]

Section 6.2.6.1.2 Processing the SessionClose Message

[7]

Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

[1]

Section 6.3.2.3 Multiple Personality Negotiation

#### 2.2.2.3 Test Procedure

- a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.
- b. If the AT has an open session with the RAN:
  1. Instruct the RAN to send a *SessionClose* message to the AT.
  2. Ensure that the AT sends a *SessionClose* message to the RAN.
- c. Cause the AT to negotiate a new session with the AN.

- 1 d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation
- 2 and that the AT is operating with the eHRPD personality. Note, the RAN should use
- 3 separate packet applications for the two personalities.
- 4 e. Ensure that the AT is dormant on the eHRPD network.
- 5 f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on
- 6 the HRPD network.
- 7 g. If the HRPD and eHRPD RANs are in different subnets:
  - 8 1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a
  - 9 *UATIAssignment* message.
  - 10 2. Ensure that the AT sends a *UATIComplete* message to the RAN.
- 11 h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to
- 12 the HRPD RAN.
- 13 i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing
- 14 the *SessionConfigurationToken* with four MSB to the HRPD personality along with a
- 15 *TrafficChannelAssignment* message. Note, the RAN should include the
- 16 *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in
- 17 the same security layer packet.
- 18 j. Verify that the AT starts using the HRPD personality, i.e. in the MAC layer header
- 19 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most
- 20 significant bits of *SessionConfigurationToken* for the HRPD personality, and that the
- 21 AT can send and receive data using *ReservationLabel 0xFF*.

#### 22 2.2.2.4 Minimum Standard

23 The AT shall comply with step j.

#### 24 2.2.3 Dormant eHRPD to HRPD mobility with eHRPD to HRPD personality switch initiated 25 in response to access

##### 26 2.2.3.1 Definition

27 This test verifies that the AT is able to switch between eHRPD and HRPD capable  
28 personalities during eHRPD to HRPD mobility. Specifically, it is verified that the AT  
29 switches to the HRPD personality when the HRPD network switches the personality along  
30 with the *UATIAssignment* message or in response to any other message sent by the AT on  
31 the access channel. The PPP renegotiation and the QoS related changes for this scenario  
32 will be tested separately.

##### 33 2.2.3.2 Traceability:

34 [2]

35 Section 2.3

Packet Application Negotiation

36 Section 3.1

Additional Requirement to support eHRPD operation

1 [6]

2 Section 6.2.6.1.2 Processing the SessionClose Message

3 [7]

4 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

5 [1]

6 Section 6.3.2.3 Multiple Personality Negotiation

### 7 2.2.3.3 Test Procedure

- 8 a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to  
 9 the AT and HRPD system is unavailable to the AT. It is recommended that HRPD  
 10 and eHRPD RANs are configured to be in different subnets. Note, this configuration  
 11 is useful in step g where it is required that the AT send a message on the access  
 12 channel.
- 13 b. If the AT has an open session with the AN:
- 14 1. Instruct the RAN to send a *SessionClose* message to the AT.
  - 15 2. Ensure that the AT sends a *SessionClose* message to the RAN.
- 16 c. Cause the AT to negotiate a new session with the RAN.
- 17 d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation  
 18 and that the AT is operating with the eHRPD personality. Note, the RAN should use  
 19 separate packet applications for the two personalities.
- 20 e. Ensure that the AT is dormant on the eHRPD network.
- 21 f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on  
 22 the HRPD network.
- 23 g. Cause the AT to send a message on the access channel. For example, the AT may  
 24 send a *UATIRequest* message.
- 25 h. Instruct the HRPD network to send an *AttributeUpdateRequest* changing the  
 26 *SessionConfigurationToken* with four MSB to the HRPD personality.
- 27 i. Cause the AT to start a packet data call and establish a connection with the HRPD  
 28 RAN.
- 29 j. Verify that the AT starts using the HRPD personality, i.e. in the MAC layer header  
 30 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most  
 31 significant bits of the *SessionConfigurationToken* for the HRPD personality, and that  
 32 the AT can send and receive data using *ReservationLabel 0xFF*.

### 33 2.2.3.4 Minimum Standard

34 The AT shall comply with step j.

1 2.2.4 Dormant HRPD to eHRPD mobility with HRPD to eHRPD personality switch  
2 occurring in response to ConnectionRequest

3 2.2.4.1 Definition

4 This test verifies that the AT is able to switch between HRPD and eHRPD capable  
5 personalities. Specifically, it is verified that the AT switches to the eHRPD personality when  
6 the eHRPD network switches the personality upon receiving a *ConnectionRequest* message  
7 from the AT after the *UATIAssignment* has been made. The test assumes that the RAN is  
8 able to store the eHRPD capability of the AT and that this capability is part of session  
9 transfer during mobility across eHRPD and HRPD. The PPP renegotiation and the QoS  
10 related changes for this scenario will be tested separately.

11 Note, in the test procedure below, eHRPD and HRPD personalities are first negotiated in an  
12 eHRPD network in steps a-e. This is followed by an eHRPD to HRPD dormant mobility in  
13 steps f-k. These steps are necessary as it is assumed that the HRPD network may not be  
14 capable of negotiating an eHRPD personality.

15 2.2.4.2 Traceability:

16 [2]

17 Section 2.3 Packet Application Negotiation

18 Section 3.1 Additional Requirement to support eHRPD operation

19 [6]

20 Section 6.2.6.1.2 Processing the SessionClose Message

21 [7]

22 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

23 [1]

24 Section 6.3.2.3 Multiple Personality Negotiation

25 2.2.4.3 Test Procedure

26 a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to  
27 the AT and HRPD system is unavailable to the AT. It is recommended that HRPD  
28 and eHRPD RANs are configured to be in different subnets.

29 b. If the AT has an open session with the RAN:

30 1. Instruct the RAN to send a *SessionClose* message to the AT.

31 2. Ensure that the AT sends a *SessionClose* message to the RAN.

32 c. Cause the AT to negotiate a new session with the AN.

33 d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation  
34 and that the AT is operating with the eHRPD personality. Note, the RAN should use  
35 separate packet applications for the two personalities.

- 1 e. Ensure that the AT is dormant on the eHRPD network.
- 2 f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on  
3 the HRPD network.
- 4 g. If the HRPD and eHRPD RANs are in different subnets:
- 5       1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a  
6       *UATIAssignment* message.
- 7       2. Ensure that the AT sends a *UATIComplete* message to the RAN.
- 8 h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to  
9 the HRPD RAN.
- 10 i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing  
11 the *SessionConfigurationToken* with four MSB to the HRPD personality along with a  
12 *TrafficChannelAssignment* message. Note, the AN should include the  
13 *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in  
14 the same security layer packet.
- 15 j. Ensure that the AT starts using the HRPD personality, i.e. in the MAC layer header  
16 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most  
17 significant bits of *SessionConfigurationToken* for the HRPD personality, and that the  
18 AT can send and receive data using *ReservationLabel 0xFF*.
- 19 k. Allow the AT to become dormant on the HRPD network.
- 20 l. Cause the pilot strength of the eHRPD network to increase such that the AT is idle  
21 on the eHRPD network.
- 22 m. If the HRPD and eHRPD RANs are in different subnets:
- 23       1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a  
24       *UATIAssignment* message.
- 25       2. Ensure that the AT sends a *UATIComplete* message to the RAN.
- 26 n. Cause the AT to send a *ConnectionRequest* message to the eHRPD RAN.
- 27 o. Instruct the eHRPD network to send an *AttributeUpdateRequest* message changing  
28 the *SessionConfigurationToken* with four MSB to the eHRPD personality along with  
29 a *TrafficChannelAssignment* message. Note, the RAN should include the  
30 *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in  
31 the same security layer packet.
- 32 p. Ensure that the AT performs EAP AKA' Authentication as specified in section 2.6.2  
33 and obtains an IP address as specified in section 2.7.2 or 2.7.3.
- 34 q. Verify that the AT starts using the eHRPD personality, i.e. in the MAC layer header  
35 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most  
36 significant bits of *SessionConfigurationToken* for the eHRPD personality, and that  
37 the AT can send and receive data using *ReservationLabel 0xFF* that is bound to the  
38 EMPA Link Flow with the *ProtocolID* field of the *FlowNNFlowProtocolParametersFwd*  
39 and *FlowNNFlowProtocolParametersRev* attributes negotiated to a value *0x07*.

1 2.2.4.4 Minimum Standard

2 The AT shall comply with step q.

3 2.2.5 Dormant HRPD to eHRPD mobility with HRPD to eHRPD personality switch initiated  
4 in response to access

5 2.2.5.1 Definition

6 This test verifies that the AT is able to switch between HRPD and eHRPD capable  
7 personalities. Specifically, it is verified that the AT switches to the eHRPD personality when  
8 the eHRPD network switches the personality along with the *UATIAssignment* message or in  
9 response to any other message sent by the AT on the access channel. The test assumes that  
10 the RAN is able to store the eHRPD capability of the AT and that this capability is part of  
11 session transfer during mobility across eHRPD and HRPD. The PPP renegotiation and the  
12 QoS related changes for this scenario will be tested separately.

13 Note, in the test procedure below, eHRPD and HRPD personalities are first negotiated in an  
14 eHRPD network in steps a-e. This is followed by an eHRPD to HRPD dormant mobility in  
15 steps f-k. These steps are necessary as it is assumed that the HRPD network may not be  
16 capable of negotiating an eHRPD personality.

17 2.2.5.2 Traceability:

18 [2]

19 Section 2.3 Packet Application Negotiation

20 Section 3.1 Additional Requirement to support eHRPD operation

21 [6]

22 Section 6.2.6.1.2 Processing the SessionClose Message

23 [7]

24 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

25 [1]

26 Section 6.3.2.3 Multiple Personality Negotiation

27 2.2.5.3 Test Procedure

28 a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to  
29 the AT and HRPD system is unavailable to the AT. It is recommended that HRPD  
30 and eHRPD RANs are configured to be in different subnets.

31 b. If the AT has an open session with the RAN:

32 1. Instruct the RAN to send a *SessionClose* message to the AT.

33 2. Ensure that the AT sends a *SessionClose* message to the RAN.

34 c. Cause the AT to negotiate a new session with the RAN.

- 1 d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation  
2 and that the AT is operating with the eHRPD personality. Note, the RAN should use  
3 separate packet applications for the two personalities.
- 4 e. Ensure that the AT is dormant on the eHRPD network.
- 5 f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on  
6 the HRPD network.
- 7 g. If the HRPD and eHRPD RANs are in different subnets:
  - 8 1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a  
9 *UATIAssignment* message.
  - 10 2. Ensure that the AT sends a *UATIComplete* message to the AN.
- 11 h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to  
12 the HRPD RAN.
- 13 i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing  
14 the *SessionConfigurationToken* with four MSB to the HRPD personality along with a  
15 *TrafficChannelAssignment* message. Note, the RAN should include the  
16 *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in  
17 the same security layer packet.
- 18 j. Ensure that the AT starts using the HRPD personality, i.e. in the MAC layer header  
19 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most  
20 significant bits of *SessionConfigurationToken* for the HRPD personality, and that the  
21 AT can send and receive data using *ReservationLabel 0xFF*.
- 22 k. Allow the AT to become dormant on the HRPD network.
- 23 l. Cause the pilot strength of the eHRPD network to increase such that the AT is idle  
24 on the eHRPD network.
- 25 m. Cause the AT to send a message on the access channel. For example, the AT may  
26 send a *UATIRequest* message.
- 27 n. Instruct the eHRPD network to send an *AttributeUpdateRequest* changing the  
28 *SessionConfigurationToken* with four MSB to the eHRPD personality.
- 29 o. Cause the AT to start a packet data call and to open a connection with the RAN and  
30 send and receive data.
- 31 p. Ensure that the AT performs EAP AKA' Authentication as specified in section 2.6.2  
32 and obtains an IP address as specified in section 2.7.2 or 2.7.3.
- 33 q. Verify that the AT starts using the eHRPD personality, i.e. in the MAC layer header  
34 the AT uses a *SessionConfigurationToken* with four MSB equal to the four most  
35 significant bits of *SessionConfigurationToken* for the eHRPD personality, and that  
36 the AT can send and receive data using *ReservationLabel 0xFF* that is bound to a  
37 *Link Flow* with *FlowNNFlowProtocolParametersFwd* and  
38 *FlowNNFlowProtocolParametersRev* attributes negotiated to a value of 0x07.

1 2.2.5.4 Minimum Standard

2 The AT shall comply with step q.

3 2.2.6 eHRPD to HRPD Dormant mobility with SCP renegotiation of ProtocolID initiated at  
4 Access

5 2.2.6.1 Definition

6 This test verifies the AT's support for negotiating ProtocolID through SCP based negotiation  
7 for dormant mobility from eHRPD to HRPD. The test assumes that the session transfer can  
8 occur through the A13 link between the HRPD and eHRPD RANs.

9 2.2.6.2 Traceability:

10 [2]

11 Section 2.3 Packet Application Negotiation

12 Section 3.1 Additional Requirement to support eHRPD operation

13 [6]

14 Section 6.2.6.1.2 Processing the SessionClose Message

15 Section 4.4.4.4.16 AttributeUpdateRequest Message

16 [7]

17 Section 2.5.4.1 Procedures

18 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

19 [1]

20 Section 6.3.2.3 Multiple Personality Negotiation

21 2.2.6.3 Test Procedure

22 a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to  
23 the AT and HRPD system is unavailable to the AT. It is recommended that HRPD  
24 and eHRPD RANs are configured to be in different subnets.

25 b. If the AT has an open session with the AN:

26 1. Instruct the RAN to send a *SessionClose* message to the AT.

27 2. Ensure that the AT sends a *SessionClose* message to the RAN.

28 c. Cause the AT to negotiate a new session with the RAN.

29 d. Ensure that the RAN negotiates and AT accepts a value of 0x07 for the ProtocolID  
30 field of the FlowNNFlowProtocolParametersFwd and  
31 FlowNNFlowProtocolParametersRev attributes for the EMPA Link Flow bound to  
32 ReservationLabel 0xFF.

33 e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.

- 1 f. Ensure that the AT is dormant on the eHRPD network.
- 2 g. Cause the pilot strength of the HRPD network to increase such that the AT is idle on  
3 the HRPD network.
- 4 h. If the HRPD and eHRPD ANs are in different subnets:
- 5       1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a  
6       *UATIAssignment* message.
- 7       2. Ensure that the AT sends a *UATIComplete* message to the RAN.
- 8 i. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a  
9 *ConnectionRequest* message to the HRPD RAN.
- 10 j. Instruct the RAN to send a *ConfigurationStart* message to the AT.
- 11 k. Verify that the AT sends a *ConfigurationComplete* or *ConfigurationRequest* message to  
12 the RAN.
- 13 l. If the AT sends a *ConfigurationRequest* message to the RAN, ensure that the RAN  
14 sends a *ConfigurationResponse* message and accepts the values proposed in the  
15 *ConfigurationRequest* message.
- 16 m. During the AN initiated session configuration phase ensure that the RAN does not  
17 propose a value of 0x07 or 0x08 for the ProtocolID field of the  
18 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
19 attributes of the Link Flow bound to ReservationLabel 0xFF.
- 20 n. Verify that the AT accepts the values proposed by the RAN and sends a  
21 *ConfigurationResponse* message in response to the *ConfigurationRequest* message  
22 sent by the RAN.
- 23 o. Instruct the RAN to send a *ConfigurationComplete* message to the AT. If the RAN  
24 does not negotiate additional personality, ensure that the RAN sends the  
25 *ConfigurationComplete* message with PersonalityIndexStore field set to a value that  
26 overrides the existing personality. If the RAN negotiated multiple personalities,  
27 ensure that the RAN sends the *ConfigurationComplete* message with  
28 PersonalityIndexStore field set to the HRPD personality. Note, the RAN should use  
29 Multi Flow Packet Application in the HRPD network.
- 30 p. Verify that the AT sends a *ConnectionClose* message to the RAN.
- 31 q. Cause the AT to establish a packet data call by starting any application.
- 32 r. Verify that the AT can send and receive data ReservationLabel 0xFF that is bound to  
33 an EMPA Link Flow with ProtocolID field of the FlowNNFlowProtocolParametersFwd  
34 and FlowNNFlowProtocolParametersRev attributes negotiated to a value other than  
35 0x07 and 0x08.
- 36 s. If the RAN negotiated multiple personalities during session reconfiguration, verify  
37 that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT  
38 uses a SessionConfigurationToken with four MSB equal to the four most significant

1 bits of SessionConfigurationToken for the HRPD personality, and that the AT can  
2 send and receive data using ReservationLabel 0xFF.

- 3 t. Repeat the test with RAN negotiating a separate personality and renegotiating the  
4 same personality during session renegotiation by setting the HRPD personality using  
5 the PersonalityIndexStore field in the *ConfigurationComplete* message in step o.

6 2.2.6.4 Minimum Standard

7 The AT shall comply with steps k, n, p, and s.

8 2.2.7 HRPD to eHRPD Dormant mobility with SCP Renegotiation of ProtocolID initiated at  
9 Access

10 2.2.7.1 Definition

11 This test verifies the AT's support for negotiating ProtocolID through SCP based negotiation  
12 for dormant mobility from HRPD to eHRPD. The test assumes that the session transfer can  
13 occur through the A13 link between the HRPD and eHRPD RANs.

14 2.2.7.2 Traceability:

15 [2]

- 16 Section 2.3 Packet Application Negotiation  
17 Section 3.1 Additional Requirement to support eHRPD operation

18 [6]

- 19 Section 6.2.6.1.2 Processing the SessionClose Message  
20 Section 4.4.4.4.16 AttributeUpdateRequest Message

21 [7]

- 22 Section 2.5.4.1 Procedures  
23 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

24 [1]

- 25 Section 6.3.2.3 Multiple Personality Negotiation

26 2.2.7.3 Test Procedure

- 27 a. Connect the AT as shown in Figure 1. Ensure that the HRPD system is available to  
28 the AT and eHRPD system is unavailable to the AT. It is recommended that HRPD  
29 and eHRPD RANs are configured to be in different subnets.
- 30 b. If the AT has an open session with the AN:
- 31 1. Instruct the RAN to send a *SessionClose* message to the AT.  
32 2. Ensure that the AT sends a *SessionClose* message to the RAN.
- 33 c. Cause the AT to negotiate a new session with the RAN.

- 1 d. Ensure that the AN does not negotiate a value of 0x07 or 0x08 for of the ProtocolID  
2 field of the FlowNNFlowProtocolParametersFwd and  
3 FlowNNFlowProtocolParametersRev attributes of the EMPA Link flow that is bound  
4 to ReservationLabel 0xFF.
- 5 e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.
- 6 f. Ensure that the AT is dormant on the HRPD network.
- 7 g. Cause the pilot strength of the eHRPD sector to increase such that the AT is idle on  
8 the eHRPD network.
- 9 h. If the HRPD and eHRPD RANs are in different subnets:
  - 10 1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a  
11 *UATIAssignment* message.
  - 12 2. Ensure that the AT sends a *UATIComplete* message to the RAN.
- 13 i. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a  
14 *ConnectionRequest* message to the HRPD RAN.
- 15 j. Instruct the RAN to send a *ConfigurationStart* message to the AT.
- 16 k. Verify that the AT sends a *ConfigurationComplete* or *ConfigurationRequest* message to  
17 the RAN.
- 18 l. If the AT sends a *ConfigurationRequest* message to the RAN, ensure that the RAN  
19 sends a *ConfigurationResponse* message and accepts the values proposed in the  
20 *ConfigurationRequest* message.
- 21 m. During the RAN initiated session configuration phase ensure that the RAN proposes  
22 the a value of 0x07 for the ProtocolID field of the  
23 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
24 attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.
- 25 n. Verify that the AT accepts the values proposed by the RAN and sends a  
26 *ConfigurationResponse* message in response to the *ConfigurationRequest* message  
27 sent by the RAN.
- 28 o. Instruct the RAN to send a *ConfigurationComplete* message to the AT. If the RAN  
29 does not negotiate additional personality, ensure that the RAN sends the  
30 *ConfigurationComplete* message with PersonalityIndexStore field set to a value that  
31 overrides the existing personality. If the RAN negotiated multiple personalities,  
32 ensure that the RAN sends the *ConfigurationComplete* message with  
33 PersonalityIndexStore field set to the eHRPD personality.
- 34 p. Verify that the AT sends a *ConnectionClose* message to the RAN.
- 35 q. Cause the AT to establish a packet data call by starting any application.
- 36 r. If the eHRPD based personality is in use, ensure that the AT performs EAP AKA'  
37 Authentication as specified in section 2.6.2 and obtains an IP address as specified in  
38 section 2.7.2 or 2.7.3.

- 1 s. Verify that the AT can send and receive data ReservationLabel 0xFF that is bound to
- 2 an EMPA Link Flow with ProtocolID field of the FlowNNFlowProtocolParametersFwd
- 3 and FlowNNFlowProtocolParametersRev attributes negotiated to a value of 0x07.
- 4 t. If the RAN negotiated multiple personalities during session reconfiguration, verify
- 5 that the AT starts using the eHRPD personality, i.e. in the MAC layer header the AT
- 6 uses a SessionConfigurationToken with four MSB equal to the four most significant
- 7 bits of the SessionConfigurationToken for the eHRPD personality, and that the AT
- 8 can send and receive data using ReservationLabel 0xFF.
- 9 u. Repeat the test with RAN negotiating a separate personality and renegotiating the
- 10 same personality during session renegotiation by setting the eHRPD personality
- 11 using the PersonalityIndexStore field in the *ConfigurationComplete* message in step
- 12 o.

#### 13 2.2.7.4 Minimum Standard

14 The AT shall comply with steps k, n, p, s, and t.

#### 15 2.2.8 Session Renegotiation when Session Transfer is Unsuccessful

##### 16 2.2.8.1 Definition

17 This test verifies the AT's support for negotiating a new session when session transfer fails.

##### 18 2.2.8.2 Traceability:

19 [2]

20 Section 2.3 Packet Application Negotiation

21 Section 3.1 Additional Requirement to support eHRPD operation

22 [6]

23 Section 6.2.6.1.2 Processing the SessionClose Message

24 Section 4.4.4.4.16 AttributeUpdateRequest Message

25 [7]

26 Section 2.5.4.1 Procedures

27 Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

28 [1]

29 Section 6.3.2.3 Multiple Personality Negotiation

##### 30 2.2.8.3 Test Procedure

- 31 a. Connect the AT and the RAN as shown in Figure 1. Ensure that HRPD system is
- 32 available to the AT and eHRPD system is unavailable to the AT. It is recommended
- 33 that HRPD and eHRPD RANs are configured to be in different subnets.
- 34 b. If the AT has an open session with the RAN:

- 1 1. Instruct the RAN to send a *SessionClose* message to the AT.
- 2 2. Ensure that the AT sends a *SessionClose* message to the RAN.
- 3 c. Cause the AT to negotiate a new session with the RAN.
- 4 d. Ensure that the AN does not negotiate a value of 0x07 or 0x08 for of the ProtocolID  
5 field of the FlowNNFlowProtocolParametersFwd and  
6 FlowNNFlowProtocolParametersRev attributes of the EMPA Link flow that is bound  
7 to ReservationLabel 0xFF.
- 8 e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.
- 9 f. Ensure that the AT is dormant on the HRPD network.
- 10 g. Cause the pilot strength of the eHRPD sector to increase such that the AT is idle on  
11 the eHRPD network.
- 12 h. If the HRPD and eHRPD RANs are in different subnets, ensure that the AT sends a  
13 *UATIRequest* message.
- 14 i. If the HRPD and eHRPD ANs are in different subnets cause the AT to send a  
15 *ConnectionRequest* message to the eHRPD RAN.
- 16 j. Instruct the RAN to send a *SessionClose* message to the AT.
- 17 k. Verify that the AT sends a *SessionClose* message to the RAN.
- 18 l. Verify the AT sends a *UATIRequest* message to RAN.
- 19 m. Ensure that RAN sends a *UATIAssignment* message to the AT.
- 20 n. Verify the AT sends a *UATIComplete* message.
- 21 o. Verify that the AT negotiates a new session with the RAN.
- 22 p. Verify the AT completes session negotiation as specified in 2.1.2.
- 23 q. Cause the pilot strength of the HRPD sector to increase such that the AT is idle on  
24 the HRPD network.
- 25 r. If the HRPD and eHRPD RANs are in different subnets, ensure that the AT sends a  
26 *UATIRequest* message.
- 27 s. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a  
28 *ConnectionRequest* message to the HRPD RAN.
- 29 t. Repeat steps j-o.
- 30 u. Verify the AT completes session negotiation as specified in 2.1.3.
- 31 v. Start a packet data application.
- 32 w. Verify that the AT can send and receive data.

#### 33 2.2.8.4 Minimum Standard

34 The AT shall comply with steps k, l, n, o, p, u and w.

## 2.3 cdma2000 1x and eHRPD Mobility

### 2.3.1 Introduction

Test cases in this section test the functionality for mobility across eHRPD and cdma2000 1x.

### 2.3.2 Dormant 1x to eHRPD System Reselection

#### 2.3.2.1 Definition

This test verifies the AT can successfully switch from dormant cdma2000 1x to idle eHRPD. The table below describes the PPP and air interface states:

**Table 1. PPP State for cdma2000 1x to eHRPD mobility**

Technology	Initial PPP State/Initial Air Interface State	Final PPP State/Final Air Interface State
cdma2000 1x	Dormant/Idle	Null/Idle
eHRPD	Null/Null	Dormant/Idle

#### 2.3.2.2 Traceability:

[2]

Section 5.4.6.1.6 Connected State

Section 5.4.6.1.5 Idle State

[8]

Section 2.6.2 Mobile Station Idle State

#### 2.3.2.3 Test Procedure

- a. Connect the AT as shown in Figure 1.
  1. RAN1 is eHRPD capable
  2. RAN2 is cdma2000 1x capable
- b. Ensure that E-UTRAN system is not available.
- c. Ensure the AT does not have a previously established session on the RAN1.
- d. Ensure the AT is Idle with no PPP session on RAN2 (cdma2000 1x).
- e. Set up a mobile originated Service Option 33 call on AN 2. The air interface shall enter the Mobile Station Control on Traffic Channel State. The PPP session shall be active.
- f. Allow the AT to transition to the dormant PPP state and air interface Idle State.

- 1 g. Cause the AT to acquire RAN1. This may be done by decreasing attenuation on  
2 RAN1 and increasing attenuation on RAN2.
- 3 h. Verify the AT acquires RAN1.
- 4 i. Verify the AT negotiates the eHRPD session as specified in Section 2.1.2.
- 5 j. Initiate a data call on the eHRPD network (Note: The IP continuity will not be  
6 maintained after switching from cdma2000 1x to eHRPD). See 2.6.2, 2.7.2, and  
7 2.7.3 for PPP setup procedures.
- 8 k. Verify the call is successful and the AT can send/receive data using the eHRPD  
9 network.

#### 10 2.3.2.4 Minimum Standard

11 The AT shall comply with steps h, i, and k.

#### 12 2.3.3 Dormant eHRPD to 1x

##### 13 2.3.3.1 Definition

14 This test verifies the AT can successfully switch from dormant eHRPD to idle cdma2000 1x.  
15 The table below describes the PPP and air interface states:

16 **Table 2. PPP State for eHRPD to cdma2000 1x mobility**

<b>Technology</b>	<b>Initial PPP State/Initial Air Interface State</b>	<b>Final PPP State/Final Air Interface State</b>
cdma2000 1x	Null/Idle	Dormant/Idle
eHRPD	Dormant/Idle	Null/Idle

17 Steps k-n in this test further verify that the AT is able to maintain the eHRPD session  
18 when it returns to the eHRPD network before the session has expired.

##### 19 2.3.3.2 Traceability:

20 [2]

21 Section 5.4.6.1.6 Connected State

22 Section 5.4.6.1.5 Idle State

23 [8]

24 Section 2.6.2 Mobile Station Idle State

##### 25 2.3.3.3 Test Procedure

- 26 a. Connect the AT as shown in Figure 1
- 27 1. RAN1 is eHRPD capable
- 28 2. RAN2 is cdma2000 1x capable

- 1        b. Ensure there is no E-UTRAN available.
- 2        c. Ensure the AT establishes an eHRPD Session on RAN1 using the procedure specified
- 3            in 2.1.2.
- 4        d. Ensure the AT is Idle with no PPP session on RAN1.
- 5        e. Set up a mobile originated data call on RAN1. The air interface shall enter the
- 6            Connected State. The PPP state shall be active.
- 7        f. Allow the AT to transition to the dormant PPP state and air interface Idle State.
- 8        g. Cause the AT to acquire RAN2. This may be done by increasing attenuation on RAN1
- 9            and decreasing attenuation on RAN2.
- 10       h. Verify the AT acquires RAN2.
- 11       i. Initiate a data call on the cdma2000 1x network (Note: The IP continuity will not be
- 12            maintained after switching from eHRPD to cdma2000 1x).
- 13       j. Verify the call is successful and the AT can send/receive data using the cdma2000
- 14            1x network.
- 15       k. Allow the AT to transition to the dormant PPP state and air interface Idle State.
- 16       l. Cause the AT to acquire RAN1. This may be done by decreasing attenuation on
- 17            RAN1 and increasing attenuation on RAN2. Note this step should occur before the
- 18            eHRPD session has expired.
- 19       m. Cause the AT to access the RAN1.
- 20       n. Verify the AT does not negotiate the eHRPD session, i.e. the AT sends a
- 21            *ConnectionRequest* message but does not send a *UATIRequest* message to the RAN.

22    2.3.3.4 Minimum Standard

23    The AT shall comply with steps h, j, and n.

24    2.3.4 Active eHRPD to Idle 1x

25    2.3.4.1 Definition

26    This test verifies the AT can successfully switch from active eHRPD to idle 1x. The table

27    below describes the PPP and air interface states:

28                    **Table 3. PPP State for Active eHRPD to cdma2000 1x mobility**

<b>Technology</b>	<b>Initial PPP State/Initial Air Interface State</b>	<b>Final PPP State/Final Air Interface State</b>
cdma2000 1x	Null/Idle	Dormant/Idle
eHRPD	Active/Connected	Null/Idle

1 2.3.4.2 Traceability:

2 [2]

3 Section 5.4.6.1.6 Connected State

4 Section 5.4.6.1.5 Idle State

5 [8]

6 Section 2.6.2 Mobile Station Idle State

7 2.3.4.3 Test Procedure

8 a. Connect the AT as shown in Figure 1

9 1. RAN1 is eHRPD capable

10 2. RAN2 is cdma2000 1x capable

11 b. Ensure there is no E-UTRAN available.

12 c. Ensure the AT establishes an eHRPD Session on RAN1 using the procedure specified  
13 in 2.1.2.

14 d. Ensure the AT is Idle with no PPP session on RAN1.

15 e. Set up a mobile originated data call on RAN1. The air interface shall enter the  
16 Connected State. The PPP state shall be active.

17 f. While the PPP state is still active, cause the AT to acquire RAN2. This may be done  
18 by increasing attenuation on RAN1 and decreasing attenuation on RAN2.

19 g. Verify the AT and RAN terminate the active eHRPD call.

20 h. Verify the AT acquires RAN2.

21 i. Initiate a data call on the cdma2000 1x network (Note: The IP continuity will not be  
22 maintained after switching from eHRPD to cdma2000 1x). The AT may initiate the  
23 data call autonomously.

24 j. Verify the call is successful and the AT can send/receive data using the cdma2000  
25 1x network

26 2.3.4.4 Minimum Standard

27 The AT shall comply with steps g, h, and j.

28 **2.4 E-UTRAN to eHRPD Handoff**

29 2.4.1 Introduction

30 Test cases in this section test the functionality for E-UTRAN and eHRPD interworking  
31 during system selection and handoffs.

1 2.4.2 E-UTRAN Idle to eHRPD Dormant Handoff – Previous eHRPD Session, No Pre-  
2 registration, A13-Session Information transfer available

3 2.4.2.1 Definition

4 This test verifies the AT can successfully perform an E-UTRAN Idle to eHRPD dormant  
5 handoff. The network and device are not configured to support preregistration. The AT shall  
6 have a previous eHRPD session on the source RAN. The source and target AN shall support  
7 session transfer. The procedures for the AT to select the E-UTRAN network and for the E-  
8 UTRAN network and AT to handoff are outside the scope of this document.

9 2.4.2.2 Traceability:

10 [2]

11 Section 2.3 Packet Application Negotiation

12 Section 3.1 Additional Requirement to support eHRPD operation

13 Section 5.5 Inter-Rat Overhead Protocol

14 [6]

15 Section 6.2.6.1.2 Processing the SessionClose Message

16 [3]

17 Section 13.2.2 Idle Mode Mobility for E-UTRAN to eHRPD

18 2.4.2.3 Test Procedure

- 19 a. Connect the device shown in Figure 2. RAN1 and RAN2 are eHRPD ANs on different  
20 subnets.
- 21 b. Ensure the E-UTRAN network is configured to not allow preregistration.
- 22 c. Ensure the AT has a previously established session with the eHRPD RAN1 and is  
23 currently dormant. See test case 2.1.2 for procedures regarding eHRPD session  
24 negotiation.
- 25 d. Ensure that both the eHRPD and E-UTRAN systems are available to the AT.
- 26 e. Ensure the AT is currently idle on the E-UTRAN network.
- 27 f. Cause the AT to perform cell re-selection to the eHRPD RAN2.
- 28 g. Verify that once the AT acquires the eHRPD RAN2, the AT sends a *UATIRequest*  
29 message.
- 30 h. Ensure that RAN2 sends an A13-Session Information Request to RAN1 to request  
31 the session information
- 32 i. Ensure that RAN1 sends an A13-Session Information Response to RAN2.
- 33 j. Ensure that RAN2 sends a *UATIAssignment* message to the AT
- 34 k. Verify the AT sends a *UATIComplete* message.

- 1        1. Initiate a data call from the AT to RAN2.  
 2        m. Verify that the AT is able to send and receive data using ReservationLabel 0xFF.

#### 3        2.4.2.4 Minimum Standard

4        The AT shall comply with steps g, k, and m.

#### 5        2.4.3 E-UTRAN Idle to eHRPD Dormant Handoff – Previous eHRPD Session, No Pre- 6        registration, A13- Session Information transfer not available

##### 7        2.4.3.1 Definition

8        This test verifies the AT can successfully perform an E-UTRAN Idle to eHRPD dormant  
 9        handoff. The network and device are not configured to support preregistration. The AT  
 10       shall have a previous eHRPD session on the source RAN. The source and target RAN shall  
 11       not support session information transfer. The procedures for the AT to select the E-UTRAN  
 12       network and for the E-UTRAN network and AT to handoff are outside the scope of this  
 13       document.

##### 14       2.4.3.2 Traceability:

15       [2]

16       Section 2.3	Packet Application Negotiation
17       Section 3.1	Additional Requirement to support eHRPD operation
18       Section 5.5	Inter-Rat Overhead Protocol

19       [6]

20       Section 6.2.6.1.2	Processing the SessionClose Message
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21       [3]

22       Section 13.2.2	Idle Mode Mobility for E-UTRAN to eHRPD
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##### 23       2.4.3.3 Test Procedure

- 24       a. Connect the device shown in Figure 2. RAN1 and RAN2 are eHRPD ANs on different  
 25       subnets.  
 26       b. Ensure the E-UTRAN network is configured to not allow preregistration.  
 27       c. Ensure the AT has a previously established session with the eHRPD RAN1 and is  
 28       currently dormant. See test case 2.1.2 for procedures regarding eHRPD session  
 29       negotiation.  
 30       d. Ensure that both the eHRPD and E-UTRAN systems are available to the AT.  
 31       e. Ensure the AT is currently idle on the E-UTRAN network.  
 32       f. Cause the AT to perform cell re-selection to the eHRPD RAN2.

- 1 g. Verify that once the AT acquires the eHRPD RAN2, the AT sends a *UATIRequest*
- 2 message.
- 3 h. Ensure RAN2 sends a *SessionClose* message to the AT.
- 4 i. Verify the AT sends a *SessionClose* message to RAN2.
- 5 j. Verify the AT sends a *UATIRequest* message to RAN2.
- 6 k. Ensure that RAN2 sends a *UATIAssignment* message to the AT.
- 7 l. Verify the AT sends a *UATIComplete* message.
- 8 m. Verify that the AT negotiates a new session with the RAN2.
- 9 n. Verify the AT completes session negotiation as specified in 2.1.2.

10 2.4.3.4 Minimum Standard

11 The AT shall comply with steps g, i, j, l, m and n.

12 2.4.4 Non-optimized Active E-UTRAN to eHRPD Idle – No Preregistration, Connection  
13 Release with Redirection Indication

14 2.4.4.1 Definition

15 This test verifies that the AT will acquire the eHRPD system after receiving a connection  
16 release with redirection indication on the E-UTRAN network.

17 **Table 4. PPP State for Active E-UTRAN to eHRPD Handoff due to Redirection**

<b>Technology</b>	<b>Initial PPP State/Initial Air Interface State</b>	<b>Final PPP State/Final Air Interface State</b>
E-UTRAN	Active/Active	Null/Null
eHRPD	Null/Null	Dormant/Idle

18 2.4.4.2 Traceability:

19 [2]

20 Section 3.1 Additional Requirement to support eHRPD operation

21 Section 5.5 Inter-Rat Overhead Protocol

22 [3]

23 Section 5.4.1.1.1 IP Address Allocation: VSNCP Configure-Request

24 Section 10.1.4.1 3GPP2 VSNCP Configuration Options

25 Section 10.1.4.2 3GPP2 VSNCP Configuration-Request

26 [9]

27 Section 8.1.4 RRC Connection Release

### 2.4.4.3 Test Procedure

- a) Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-UTRAN RAN is needed.
  - 1) RAN1 is eHRPD capable
  - 2) RAN3 is E-UTRAN capable
- b) The AT may or may not have a previously established session on RAN1. See 2.1.2 for procedures on establishing a new eHRPD session.
- c) Ensure the AT is in the ECM\_Idle state with no PPP session on RAN3.
- d) Set up a mobile originated data call on RAN3. The air interface shall enter the active state. The PPP session shall be active.
- e) Cause the AN to send a *RRCConnectionRelease* message directing the AT to RAN1.
- f) Verify the AT acquires RAN1.
- g) Verify the AT attaches to the eHRPD network. If the AT did not have a previous eHRPD session or the existing session has expired, see 2.1.2 for eHRPD session negotiation.
- h) Ensure that the application requesting data connection remains active.
- i) Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:
  - 1) PDN Type = IPv4, IPv6, IPv4v6
  - 2) PDN Address = [Valid IP address of AT for APN]
  - 3) Attach Type = 3 (Handover)
  - 4) Protocol Configuration Options = Bearer Control Mode used
  - 5) Address Allocation Cause = 0 (Null)
- j) Initiate a mobile originated data call on the eHRPD network
- k) Verify that the IP continuity is maintained after switching from E-UTRAN to eHRPD.
- l) Verify the call is successful and the AT can send/receive data using the eHRPD network.

### 2.4.4.4 Minimum Standard

The AT shall comply with steps f), g), i), k) and l).

### 2.4.5 Non-Optimized Active E-UTRAN to idle eHRPD System Selection – E-UTRAN System Lost – No preregistration

#### 2.4.5.1 Definition

This test verifies that the AT will acquire eHRPD after the E-UTRAN system is lost during an active call on the E-UTRAN network.

**Table 5. PPP State for Active E-UTRAN to eHRPD Handoff due to System Loss**

<b>Technology</b>	<b>Initial PPP State/Initial Air Interface State</b>	<b>Final PPP State/Final Air Interface State</b>
E-UTRAN	Active/Active	Null/Null
eHRPD	Null/Null	Dormant/Idle

## 2.4.5.2 Traceability:

[2]

- Section 3.1 Additional Requirement to support eHRPD operation
- Section 5.5 Inter-Rat Overhead Protocol

[3]

- Section 5.4.1.1.1 IP Address Allocation: VSNCP Configure-Request
- Section 10.1.4.1 3GPP2 VSNCP Configuration Options
- Section 10.1.4.2 3GPP2 VSNCP Configuration-Request

## 2.4.5.3 Test Procedure

- a. Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-UTRAN RAN is needed.
  1. RAN1 is eHRPD capable
  2. RAN3 is E-UTRAN capable
- b. The AT may or may not have a previously established session on the RAN1. See 2.1.2 for procedures on establishing a new eHRPD session.
- c. Ensure the AT is in the ECM\_Idle state with no PPP session on RAN3.
- d. Set up a mobile originated data call on RAN3. The air interface shall enter the active state. The PPP session shall be active.
- e. Degrade the RF on RAN3 sufficiently so that the call is dropped and the device enters the system determination. Ensure the RF impairments on RAN3 will prevent the device from acquiring it.
- f. Verify the AT acquires RAN1.
- g. Verify the AT attaches to the eHRPD network. If the AT did not have a previous eHRPD session or the existing session has expired, see 2.1.2 for eHRPD session negotiation.
- h. Initiate a mobile originated data call on the eHRPD network.
- i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

- 1) PDN Type = IPv4, IPv6, IPv4v6
  - 2) PDN Address = [Valid IP address of AT for APN]
  - 3) Attach Type = 3 (Handover)
  - 4) Protocol Configuration Options = Bearer Control Mode used
  - 5) Address Allocation Cause = 0 (Null)
- j. Verify that the IP continuity is maintained after switching from E-UTRAN to eHRPD.
- k. Verify the call is successful and the AT can send/receive data using the eHRPD network.

#### 2.4.5.4 Minimum Standard

The AT shall comply with steps f, g, i, j and k.

## 2.5 Dormant eHRPD to Idle E-UTRAN Handoff

### 2.5.1 Introduction

Test cases in this section test the functionality for eHRPD to E-UTRAN interworking during system selection and handoffs.

### 2.5.2 Non-optimized Dormant eHRPD to Idle E-UTRAN System Reselection

#### 2.5.2.1 Definition

This test verifies that a device can successfully transition from eHRPD to the E-UTRAN system based on system selection. The system determination algorithm for the device is implementation specific.

**Table 6. PPP State for Dormant eHRPD to E-UTRAN Handoff**

Technology	Initial PPP State/Initial Air Interface State	Final PPP State/Final Air Interface State
E-UTRAN	Null/Idle	Dormant/ECM_IDLE
eHRPD	Dormant/Idle	Null/Null

#### 2.5.2.2 Traceability:

[2]

Section 3.1 Additional Requirement to support eHRPD operation

Section 5.5 Inter-Rat Overhead Protocol

[3]

Section 5.4.1.1.1 IP Address Allocation: VSNCP Configure-Request

1 Section 10.1.4.1 3GPP2 VSNCP Configuration Options

2 Section 10.1.4.2 3GPP2 VSNCP Configuration-Request

3 Section 2.3 Packet Application Negotiation

4 2.5.2.3 Test Procedure

5 a. Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-  
6 UTRAN RAN is needed.

7 1. RAN1 is eHRPD capable

8 2. RAN3 is E-UTRAN capable

9 b. Ensure there is no E-UTRAN available.

10 c. The AT may or may not have a previously established session on RAN1. See 2.1.2 for  
11 procedures on establishing a new eHRPD session.

12 d. Ensure the AT is Idle with no PPP session on RAN1.

13 e. Set up a mobile originated data call on RAN1. The air interface shall enter the  
14 Connected State. The PPP session shall be active.

15 f. Allow the AT to transition to the dormant PPP state and air interface Idle State.

16 g. Cause the AT to acquire RAN3. This may be achieved by increasing attenuation on  
17 RAN1 and decreasing attenuation on RAN3. Note: The algorithm used by the device  
18 for system selection is implementation dependent. There can be multiple triggers for  
19 acquiring RAN3. For example, a device may use better system reselection procedures  
20 to periodically search for preferred systems or the device may lose coverage of RAN1  
21 and start a new system search. These requirements are operator dependent and all  
22 applicable scenarios should be executed.

23 h. Verify the AT acquires RAN3.

24 i. Verify the AT attaches to the E-UTRAN network.

25 j. Initiate a mobile originated data call on the E-UTRAN network.

26 k. Verify the IP continuity is maintained after switching from eHRPD to E-UTRAN.

27 l. Verify the call is successful and the AT can send/receive data using the E-UTRAN  
28 network.

29 2.5.2.4 Minimum Standard

30 The AT shall comply with steps h, i, k, and l.

31 **2.6 PPP Based Main-Service Connection Establishment**

32 2.6.1 Introduction

33 Tests included in this section verify PPP session establishment and authentication  
34 procedures. It is assumed that E-UTRAN is unavailable.

1 2.6.2 EAP AKA' Authentication during Initial PPP session establishment

2 2.6.2.1 Definition

3 This test verifies that EAP is successfully negotiated as the authentication protocol and  
4 EAP-AKA' authentication is successful during PPP session establishment in eHRPD.

5 2.6.2.2 Traceability:

6 [3]

7	Section 3.1	Definitions
8	Section 5.2.1	EAP Protocol Negotiation
9	Section 5.2.2.1	UE Identity Management
10	Section 5.2.2.2	UE Network Access Authentication
11	Section 10.1.1	Establishment of a Main-Service Connection
12	Section 10.1.3	PPP Based Main-Service Connection

13 2.6.2.3 Test Procedure

- 14 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
15 unavailable to the AT.
- 16 b. Ensure that the AT is in inactive/NULL state, i.e. no PPP session exists between the  
17 AT and the HSGW.
- 18 c. Ensure that the AT establishes an eHRPD session with the AN, i.e. the AT has  
19 accepted a value of 0x07 for the ProtocolID field of  
20 FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
21 attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.
- 22 d. Cause the AT to start the PPP session establishment. This can be triggered by  
23 starting an application that requires data transmission by the AT.
- 24 e. Verify that the AT sends a LCP-Configure-Request message to the HSGW.
- 25 f. Ensure that the HSGW sends a LCP-Configure-Ack message to the AT.
- 26 g. Ensure that the HSGW sends a LCP-Configure-Request message with  
27 Authentication-Protocol option set to C227 (EAP).
- 28 h. Verify that the AT sends a LCP-Configure-Ack message to the HSGW and accepts  
29 EAP based authentication.
- 30 i. Instruct the HSGW to send an EAP Request/Identity to the AT.
- 31 j. Verify that the AT sends an EAP Response / Identity with Identity='IMSI-NAI' to the  
32 HSGW.
- 33 k. Ensure that the HSGW sends an EAP-Request/AKA'-Challenge to the AT. Ensure  
34 that the AMF separation bit is set to 1 and that other fields such as AUTN are set  
35 correctly.

- 1        1. Verify that the AT sends an EAP-Response/AKA'-Challenge carrying the MAC and  
2        the RES fields.
- 3        m. If the AT receives an EAP-Request/AKA'-Notification message from the HSGW, verify  
4        that the AT sends an EAP-Response/AKA'-Notification message to the HSGW. Verify  
5        that the fields included in the EAP-Response/AKA'-Challenge are correct. This can  
6        be verified if the HSGW sends an EAP-Success to the AT.

7        2.6.2.4 Minimum Standard

8        The AT shall comply with steps e, h, j, l, and m.

9        2.6.3 EAP AKA' Authentication Failure during Initial PPP session establishment (Incorrect  
10        AUTN)

11       2.6.3.1 Definition

12       This test verifies AT behavior when EAP AKA' authentication failure occurs during PPP  
13       session negotiation in eHRPD establishment.

14       2.6.3.2 Traceability:

15       [3]

16       Section 3.1	Definitions
17       Section 5.2.1	EAP Protocol Negotiation
18       Section 5.2.2.1	UE Identity Management
19       Section 5.2.2.2	UE Network Access Authentication
20       Section 10.1.1	Establishment of a Main-Service Connection
21       Section 10.1.3	PPP Based Main-Service Connection

22       2.6.3.3 Test Procedure

- 23       a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
24       unavailable to the AT.
- 25       b. Ensure that the AT is in inactive/NULL state, i.e. no PPP session exists between the  
26       AT and the HSGW.
- 27       c. Ensure that the AT establishes an eHRPD session with the AN, i.e. the AT has  
28       accepted a value of 0x07 for the ProtocolID field of  
29       FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev  
30       attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.
- 31       d. Cause the AT to start the PPP session establishment. This can be triggered by  
32       starting an application that requires data transmission by the AT.
- 33       e. Ensure that the AT sends a LCP-Configure-Request message to the HSGW.
- 34       f. Ensure that the HSGW sends a LCP-Configure-Ack message to the AT.

- 1 g. Ensure that the HSGW sends a LCP-Configure-Request message with  
2 Authentication-Protocol option set to C227 (EAP).
- 3 h. Ensure that the AT sends a LCP-Configure-Ack message to the HSGW and accept  
4 EAP based authentication.
- 5 i. Instruct the HSGW to send an EAP-Request/AKA'-Challenge to the AT with AUTN  
6 field set incorrectly.
- 7 j. Verify that the AT sends an EAP-Response/AKA-Authentication-Reject to the HSGW.
- 8 k. Ensure that the HSGW sends an EAP-Failure to the AT.
- 9 l. Verify that the AT sends a LCP-Term-Request to the HSGW.
- 10 m. If the AT supports cdma2000 1x and cdma2000 1x system is available, the  
11 subsequent call may be placed over cdma2000 1x system. Note that this behavior is  
12 implementation dependent.
- 13 n. If the AT and the RAN support HRPD, the subsequent call may be placed over HRPD  
14 system. Note that this behavior is implementation dependent. For example, HRPD  
15 based personality may be negotiated or a new HRPD session may be negotiated.
- 16 o. If the AT supports fallback to cdma2000 1x or HRPD, verify that the AT obtains an  
17 IP address from the PDSN and is able to send and receive best effort data.

#### 18 2.6.3.4 Minimum Standard

19 The AT shall comply with steps j and l.

20 The AT should comply with step o.

## 21 **2.7 IP Address Assignment and PDN Attach and Detach** 22 **Procedures**

### 23 2.7.1 Introduction

24 This section contains tests for IP address assignment and PDN attach and Detach  
25 procedures.

### 26 2.7.2 IPv4 address assignment through VSNCP

#### 27 2.7.2.1 Definition

28 This test verifies that the AT can use VSNCP to obtain an IPv4 address from the eHRPD  
29 HSGW. The test is applicable to ATs that support IPv4.

#### 30 2.7.2.2 Traceability:

31 [3]

32 Section 5.4.5.1 IPv4 Address Allocation during PDN Connection  
33 Establishment

34 Section 5.4.5.4 IPv6 Address Allocation

1	Section 10.1.4.1	3GPP2 VSNCP Configuration Options
2	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
3	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
4	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
5	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

6 2.7.2.3 Test Procedure

- 7 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
8 unavailable to the AT.
- 9 b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4  
10 address.
- 11 c. Ensure that the AT does not have an IPv4 address assigned from the network. Note,  
12 this step may require HSGW to send a PPP VSNCP Terminate-Request.
- 13 d. If the AT has an open session with the RAN, instruct the RAN to send a  
14 *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*  
15 message to the RAN.
- 16 e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
17 provisioned.
- 18 f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the  
19 session negotiation is successful.
- 20 g. Cause the AT to start the PPP session establishment. This can be triggered by  
21 starting an application that requires data transmission by the AT.
- 22 h. Ensure that the AT has been successfully authenticated and the HSGW sends an  
23 EAP-Success message to the AT.
- 24 i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the  
25 following fields:
  - 26 1) PDN Address = 0
  - 27 2) IPv4 Default Router Address= 0.0.0.0
  - 28 3) Attach Type = Initial
  - 29 4) PDN-ID
  - 30 5) PDN type = 1 or 3.
- 31 j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
32 containing the IPv4 address and the PDN-ID.
- 33 k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
34 the PDN-ID to the AT.
- 35 l. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to  
36 the HSGW.

- 1 m. Verify that the AT can send and receive data for the assigned IPv4 address using the  
2 PDN-ID used by the AT in step i.

### 3 2.7.2.4 Minimum Standard

4 The AT shall comply with steps i, l, and m.

### 5 2.7.3 IPv6 address assignment through VSNCP

#### 6 2.7.3.1 Definition

7 This test verifies that the AT can use VSNCP to obtain an IPv6 address from the eHRPD  
8 HSGW. The test is applicable to ATs that support IPv6.

#### 9 2.7.3.2 Traceability:

10 [3]

11	Section 5.4.1.1.1	IP Address Allocation: VSNCP Configure-Request
12	Section 5.4.5.4	IP Address Allocation: VSNCP Configure-Ack
13	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
14		Establishment
15	Section 5.4.5.4	IPv6 Address Allocation
16	Section 10.1.4.1	3GPP2 VSNCP Configuration Options
17	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
18	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
19	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
20	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

#### 21 2.7.3.3 Test Procedure

- 22 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
23 unavailable to the AT.
- 24 b. Configure the PDN-GW to assign IPv6 address and disable DHCP support at the  
25 HSGW.
- 26 c. Ensure that Router Advertisement broadcast is disabled at the HSGW. Note, if step  
27 n, is not supported, the test should be repeated with Router Advertisement  
28 broadcast is enabled at the HSGW.
- 29 d. Ensure that the AT does not have an IPv6 address assigned from the network. Note,  
30 this step may require HSGW to send a PPP VSNCP Terminate-Request.
- 31 e. If the AT has an open session with the RAN, instruct the RAN to send a  
32 *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*  
33 message to the RAN.

- 1 f. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)
- 2 provisioned.
- 3 g. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the
- 4 session negotiation is successful.
- 5 h. Cause the AT to start the PPP session establishment. This can be triggered by
- 6 starting an application that requires data transmission by the AT.
- 7 i. Ensure that the AT has been successfully authenticated and the HSGW sends an
- 8 EAP-Success message to the AT.
- 9 j. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the
- 10 following fields:
  - 11 1. PDN Address = 0
  - 12 2. Attach Type = Initial
  - 13 3. PDN-ID
  - 14 4. PDN type = 2 or 3.
- 15 k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT
- 16 containing the IPv6 Interface Identifier in the PDN address field and the PDN-ID.
- 17 l. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing
- 18 the PDN-ID to the AT.
- 19 m. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to
- 20 the HSGW.
- 21 n. If the AT does not receive Router Advertisement message from the HSGW, verify that
- 22 the AT sends a Router Solicitation message to the HSGW.
- 23 o. Ensure that the HSGW sends a Router Advertisement message containing the IPv6
- 24 home network prefix.
- 25 p. Verify that the AT can send and receive data for the assigned Ipv6 address using the
- 26 PDN-ID used by the AT in step j.

#### 27 2.7.3.4 Minimum Standard

28 The AT shall comply with steps j, m, and p.

29 AT should comply with steps n.

#### 30 2.7.4 HSGW initiated PDN release through VSNCP

##### 31 2.7.4.1 Definition

32 This test verifies that the AT supports PDN detach procedures through VSNCP, when the  
33 HSGW initiates these procedures.

##### 34 2.7.4.2 Traceability:

35 [3]

1	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
2		Establishment
3	Section 5.4.5.4	IPv6 Address Allocation
4	Section 11.2	Network Initiated Detach and PDN Disconnection Procedure
5	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
6	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
7	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
8	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

#### 9 2.7.4.3 Test Procedure

- 10 a. Ensure that the AT can send and receive data on assigned IPv4/IPv6 address  
11 received from a PDN.
- 12 b. Ensure that the AT is transmitting data for the PDN in step a.
- 13 c. Cause the HSGW to send a VSNCP Terminate Request containing the PDN-ID for the  
14 PDN used in step a.
- 15 d. Verify that the AT sends a VSNCP Terminate Ack message containing the PDN-ID.
- 16 e. Verify that the AT stops transmitting data with the PDN-ID used in step c.
- 17 f. If the AT supports IPv4v6 repeat the test with the following changes:
- 18 1. In step a, ensure that the AT receives a dual IP address assignment from the  
19 PDN-GW.
  - 20 2. In step b, ensure that the AT is sending data using IPv4 and IPv6 addresses  
21 assigned by the PDN-GW.
  - 22 3. In step e, verify that the AT stops sending data using IPv4 address and IPv6  
23 address assigned by the PDN-GW.

#### 24 2.7.4.4 Minimum Standard

25 The AT shall comply with steps d and e.

#### 26 2.7.5 Access Terminal initiated PDN release through VSNCP

##### 27 2.7.5.1 Definition

28 This test verifies that the AT supports PDN detach procedures through VSNCP or LCP,  
29 when the AT initiates these procedures.

##### 30 2.7.5.2 Traceability:

31 [3]

32	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
33		Establishment

1	Section 5.4.5.4	IPv6 Address Allocation
2	Section 11.1	UE Initiated Detach and UE-Requested PDN Disconnection Procedure
3		
4	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
5	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
6	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
7	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

8 2.7.5.3 Test Procedure

- 9 a. Cause the AT to establish connection with two PDN-GWs (PDN-GW1 and PDN-GW2).  
10 If the AT supports IPv4 and IPv6, PDN-GW2 should assign IPv4 and IPv6 address to  
11 the AT.
- 12 b. Ensure that the AT can send and receive data on assigned IPv4/IPv6 addresses  
13 using PDN-IDs for PDN-GW1 and PDN-GW2.
- 14 c. Cause the AT to send a VSNCP Terminate Request containing the PDN-ID of PDN-  
15 GW1. Note this can be triggered by closing all the applications using the PDN-GW1.
- 16 d. Ensure that the network sends a VSNCP Terminate Ack message containing the  
17 PDN-ID of PDN-GW1.
- 18 e. Cause the AT to send a VSNCP Terminate Request containing the PDN-ID of PDN-  
19 GW2 or an LCP-Term-Request. Note this can be triggered by closing all the  
20 applications that are using the PDN-GW2.
- 21 f. Cause the AT to restart the applications that used PDN-GW1 and PDN-GW2 in step  
22 a.
- 23 g. Verify that the AT sends a VSNCP Configure Request message requesting an IP  
24 address from the PDN-GW1 and PDN-GW2.

25 2.7.5.4 Minimum Standard

26 The AT shall comply with step g.

27 2.7.6 Network Initiated PDN resynchronization VSNCP

28 2.7.6.1 Definition

29 This test verifies that the AT supports PDN resynchronization procedures through VSNCP,  
30 when the network initiates these procedures.

31 2.7.6.2 Traceability:

32 [3]

33	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection Establishment
34		

1	Section 5.4.5.4	IPv6 Address Allocation
2	Section 11.2	Network Initiated Detach and PDN Disconnection Procedure
3	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
4	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
5	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
6	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

### 7 2.7.6.3 Test Procedure

- 8 a. Ensure that the AT can send and receive data using the assigned IPv4/IPv6 address  
9 and using PDN-ID.
- 10 b. Ensure that the AT is transmitting data containing PDN-ID.
- 11 c. Cause the HSGW to send a VSNCP Configure Request containing the PDN-ID.
- 12 d. Verify that the AT sends a VSNCP Configure Request message containing the PDN-  
13 ID, APN, PDN Address, Protocol Configuration Options, and AttachType set to  
14 Handover.
- 15 e. Ensure that the HSGW sends the VSNCP Configure Ack message containing the  
16 PDN-ID, APN, PDN Address, Protocol Configuration Options, and Attach Type set to  
17 Handover to the AT. The message may contain new parameters for the PDN  
18 connection.
- 19 f. Verify that the AT sends VSNCP Configure Ack message containing the PDN-ID in  
20 step e.

### 21 2.7.6.4 Minimum Standard

22 The AT shall comply with steps d and f.

### 23 2.7.7 PPP Renegotiation upon Inter-HSGW handoff

#### 24 2.7.7.1 Definition

25 This test verifies that the AT renegotiates the PPP upon inter-HSGW handoff if it receives a  
26 LCP Configure Request message from the RAN. The procedure is applicable when the HSGW  
27 do not have an H1/H2 connectivity.

#### 28 2.7.7.2 Traceability:

29 [3]

30	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
31		Establishment
32	Section 5.4.5.4	IPv6 Address Allocation
33	Section 10.1.4.2	3GPP2 VSNCP Configure-Request

- 1       Section 10.1.4.3           3GPP2 VSNCP Configure-Ack
- 2       Section 12.3                Intra-eHRPD Handover with HSGW Relocation without
- 3                                   Context Transfer
- 4   2.7.7.3 Test Procedure
- 5       a. Connect RAN1 and RAN2 to HSGW1 and HSGW2 respectively as shown in Figure 1.
- 6       Both RAN1 and RAN2 are eHRPD capable..
- 7       b. Ensure that the AT is connected to RAN1 can send and receive data using the
- 8       assigned IPv4/IPv6 address and using a PDN-ID.
- 9       c. Ensure that the AT is transmitting data containing the PDN-ID.
- 10      d. Cause the AT to handoff to RAN2.
- 11      e. Ensure that the session transfer is completed in RAN2.
- 12      f. Instruct the HSGW2 to send a LCP-Configure-Request message with Authentication-
- 13      Protocol option set to C227 (EAP).
- 14      g. Verify that the AT sends a LCP-Configure-Ack message to the HSGW2 and accepts
- 15      EAP based authentication.
- 16      h. Instruct the HSGW2 to send an EAP Request/Identity to the AT.
- 17      i. Verify that the AT sends an EAP Response / Identity with Identity='IMSI-NAI' to
- 18      HSGW2.
- 19      j. Ensure that HSGW2 sends an EAP-Request/AKA'-Challenge to the AT. Ensure that
- 20      the AMF separation bit is set to 1 and that other fields such as AUTN are set
- 21      correctly.
- 22      k. Verify that the AT sends an EAP-Response/AKA'-Challenge carrying the MAC and
- 23      the RES fields.
- 24      l. If the AT receives an EAP-Request/AKA'-Notification message from HSGW2, verify
- 25      that the AT sends an EAP-Response/AKA'-Notification message to HSGW2.
- 26      m. Verify that the fields included in the EAP-Response/AKA'-Challenge are correct. This
- 27      can be verified if HSGW2 sends an EAP-Success to the AT.
- 28      n. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the
- 29      following fields:
- 30            1) Attach Type = handover
- 31      o. Ensure that the HSGW2 sends a PPP: VSNCP-Configure-Ack message to the AT
- 32      containing the IPv4/IPv6 address and the PDN-ID.
- 33      p. Ensure that the HSGW2 sends a PPP: VSNCP-Configure-Request message
- 34      containing the PDN-ID to the AT.
- 35      q. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to
- 36      the HSGW2.

- 1 r. Verify that the AT can send and receive data for the assigned IPv4/IPv6 address  
2 using the PDN-ID.

#### 3 2.7.7.4 Minimum Standard

4 The AT shall comply with step g, i, k, m, n, q, and r.

#### 5 2.7.8 eHRPD loss and re-acquisition before expiration of PPP timer

##### 6 2.7.8.1 Definition

7 This test verifies that an eHRPD capable AT is able to re-acquire the network and exchange  
8 data using the same PPP connection when it loses the system. The test is in absence of E-  
9 UTRAN.

##### 10 2.7.8.2 Traceability

11 [2]

12 Section 3.1 Additional Requirement to support eHRPD operation

13 [6]

14 Chapter 7 Session Layer

15 Chapter 8 Connection Layer

16 Chapter 9 MAC Layer

##### 17 2.7.8.3 Test Procedure

- 18 a. Connect the eHRPD capable AT to eHRPD RAN. Use session negotiation and  
19 establishment procedures are outlined in previous contributions 2.1.2, 2.7.2, and  
20 2.7.3.
- 21 b. Initiate an eHRPD packet data call on the AT.
- 22 c. Start an application that sends data in both directions and verify exchange of data.
- 23 d. Attenuate the RAN air link temporarily so as to cause the AT to lose the system.
- 24 e. Verify the AT drops the call and is no longer attached to the system.
- 25 f. Cause the AT to re-acquire the system.
- 26 g. Verify the PPP connection has stayed the same as before.
- 27 h. Initiate an eHRPD packet data call on the AT by sending a *ConnectionRequest*  
28 message to the RAN.
- 29 i. Verify the receipt of the *TrafficChannelAssignment* message at the AT and correct set  
30 up of the traffic channels.
- 31 j. Start an application that sends data in both directions and verify exchange of data.

1 2.7.8.4 Minimum Standard

2 The AT shall comply with steps c, e, g, i, and j.

3 2.7.9 Dual IP address (IPv4 and IPv6) assignment through VSNCP

4 2.7.9.1 Definition

5 This test verifies that the AT can use VSNCP to simultaneously obtain an IPv4 address and  
6 an IPv6 address from a PDN. The test is applicable to ATs that support IPv6.

7 2.7.9.2 Traceability:

8 [3]

9 Section 5.4.5.1 IPv4 Address Allocation during PDN Connection  
10 Establishment

11 Section 5.4.5.4 IPv6 Address Allocation

12 Section 10.1.4.1 3GPP2 VSNCP Configuration Options

13 Section 10.1.4.2 3GPP2 VSNCP Configure-Request

14 Section 10.1.4.3 3GPP2 VSNCP Configure-Ack

15 Section 10.1.4.6 3GPP2 VSNCP Terminate-Request

16 Section 10.1.4.7 3GPP2 VSNCP Terminate-Ack

17 2.7.9.3 Test Procedure

- 18 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
19 unavailable to the AT.
- 20 b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4  
21 and IPv6 address to an AT that supports both IPv4 and IPv6.
- 22 c. Ensure that the AT does not have IPv4 or IPv6 address assigned from the HSGW.  
23 Note, this step may require HSGW to send a PPP VSNCP Terminate-Request or LCP-  
24 Term request.
- 25 d. If the AT has an open session with the RAN, instruct the RAN to send a  
26 *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*  
27 message to the RAN.
- 28 e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
29 provisioned.
- 30 f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the  
31 session negotiation is successful.
- 32 g. Cause the AT to start the PPP session establishment. This can be triggered by  
33 starting an application that requires data transmission by the AT. Ensure that the  
34 application supports IPv4 address.

- 1 h. Ensure that the AT has been successfully authenticated and the HSGW sends an  
2 EAP-Success message to the AT.
- 3 i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the  
4 following fields:
- 5 1) PDN Address = 0
- 6 2) IPv4 Default Router Address= 0.0.0.0
- 7 3) Attach Type = Initial
- 8 4) PDN-ID
- 9 5) PDN type = 3.
- 10 j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
11 containing the PDN-ID, and IPv4 address as well as the IPv6 Interface Identifier in  
12 the PDN address field.
- 13 k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
14 the PDN-ID to the AT.
- 15 l. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to  
16 the HSGW.
- 17 m. If the AT does not receive Router Advertisement message from the HSGW, verify that  
18 the AT sends a Router Solicitation message to the HSGW.
- 19 n. Ensure that the HSGW sends a Router Advertisement message containing the IPv6  
20 home network prefix.
- 21 o. Start an application that requires IPv6 support and connects to the same PDN-GW  
22 as the application in step g.
- 23 p. Verify that the AT can send and receive data for the assigned IPv4 and IPv6  
24 addresses using PDN-ID used in step i.

#### 25 2.7.9.4 Minimum Standard

26 The AT shall comply with steps i, l, m, and p.

#### 27 2.7.10 UICC based APN connectivity

##### 28 2.7.10.1 Definition

29 This test verifies that the AT does not attempt to connect to an APN that is disabled in the  
30 UICC.

##### 31 2.7.10.2 Traceability

32 [3]

33 Section 5.4.5.1 IPv4 Address Allocation during PDN Connection  
34 Establishment

1	Section 5.4.5.4	IPv6 Address Allocation
2	Section 10.1.4.1	3GPP2 VSNCP Configuration Options
3	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
4	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
5	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
6	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

7 2.7.10.3 Test Procedure

- 8 a. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP) or  
9 2.7.3 (IPv6 address assignment through VSNCP) except that a non-default PDN-GW  
10 may be used. Note, default PDN gateway may be used if the associated APN can be  
11 disabled in step d.
- 12 b. Close all applications that require connectivity to the PDN-GW in step a.
- 13 c. Ensure that the AT sends a VSNCP Terminate Request for the PDN-GW in step a  
14 and that the HSGW sends a VSNCP Terminate-Ack message to the AT.
- 15 d. Disable the APN associated to the PDN-GW in step a in the UICC. This can be  
16 accomplished through multiple ways such as via provisioning. Note, if an APN is not  
17 listed in the UICC then it is assumed to be enabled. Further, the AT will need to be  
18 power cycled to ensure that the new UICC parameters take effect.
- 19 e. Start the same application that generated VSNCP Configure Request for connectivity  
20 to the PDN-GW in step a.
- 21 f. Verify that the AT does not generate the VSNCP Configure Request for the PDN-GW  
22 used in step a.

23 2.7.10.4 Minimum Standard

24 The AT shall comply with step f.

25 2.7.11 PDN Release based on Inactivity Timer

26 2.7.11.1 Definition

27 This test verifies that the AT releases a PDN connection after a period of inactivity. The  
28 setting of the PDN Inactivity timer is implementation dependent.

29 2.7.11.2 Traceability

30 [3]

31	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
32		Establishment
33	Section 5.4.5.4	IPv6 Address Allocation
34	Section 10.1.4.1	3GPP2 VSNCP Configuration Options

1	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
2	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack
3	Section 10.1.4.6	3GPP2 VSNCP Terminate-Request
4	Section 10.1.4.7	3GPP2 VSNCP Terminate-Ack

### 5 2.7.11.3 Test Procedure

- 6 a. Configure the PDN Inactivity timer to be a small value. A recommended value for  
7 test is 2 minutes.
- 8 b. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP) or  
9 2.7.3 (IPv6 address assignment through VSNCP).
- 10 c. Ensure that application requiring connectivity to PDN-GW in step b is not closed.
- 11 d. Ensure that there is no data sent or received for the PDN-GW to which the AT  
12 connected to in step b for a period of PDN Inactivity timer.
- 13 e. Verify that the AT sends a VSNCP Terminate Request for the PDN-GW in step b.  
14 Note, if this is the only PDN connection, the AT may send a LCP Termination  
15 Request without sending the VSNCP Term-Req.

### 16 2.7.11.4 Minimum Standard

17 The AT should comply with step e.

### 18 2.7.12 PDN Application Blocking for Dual IP PDN

#### 19 2.7.12.1 Definition

20 This test verifies that if an AT has an IP address assigned from a PDN capable of dual IP  
21 address assignment, the AT does not generate a VSNCP Configure request for the second IP  
22 address assignment if it already has an IP address assigned. The test procedure below  
23 requires configuration at the PDN-GW to provide only an IPv4 address. The objective is to  
24 test the blocking of either IPv4 or IPv6 application, and as an alternate procedure PDN-GW  
25 may be configured to provide only an IPv6 address and IPv4 application blocking may be  
26 verified instead.

#### 27 2.7.12.2 Traceability

28 [3]

29	Section 5.4.5.1	IPv4 Address Allocation during PDN Connection
30		Establishment
31	Section 5.4.5.4	IPv6 Address Allocation
32	Section 10.1.4.1	3GPP2 VSNCP Configuration Options
33	Section 10.1.4.2	3GPP2 VSNCP Configure-Request
34	Section 10.1.4.3	3GPP2 VSNCP Configure-Ack

1 Section 10.1.4.6 3GPP2 VSNCP Terminate-Request

2 Section 10.1.4.7 3GPP2 VSNCP Terminate-Ack

3 2.7.12.3 Test Procedure

- 4 a. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP).
- 5 b. Close the application and ensure that the AT sends a VSNCP Terminate Request for
- 6 the PDN-GW in step a and receives a VSNCP Terminate-Ack. Note AT may send a
- 7 LCP-Term Request in place of VSNCP Terminate Request.
- 8 c. Perform test procedure for test 2.7.3 (IPv6 address assignment through VSNCP)
- 9 except that the same PDN-GW as in step a is used.
- 10 d. Close the application and ensure that the AT sends a VSNCP Terminate Request for
- 11 the PDN-GW in step a and receives a VSNCP Terminate-Ack. Note AT may send a
- 12 LCP-Term Request in place of VSNCP Terminate Request.
- 13 e. Configure the PDN-GW used in step a to assign only an IPv4 address.
- 14 f. Repeat step a and ensure that the AT receives only an IPv4 address from the PDN-
- 15 GW. Note that the AT may send Router Solicitation Messages if it does not receive an
- 16 IPv6 address.
- 17 g. While the IPv4 application is active start the IPv6 application used in step c.
- 18 h. Verify that the AT does not generate a VSNCP Configure Request for the IPv6
- 19 application.

20 2.7.12.4 Minimum Standard

21 The AT should comply with step h.

22 **2.8 PDN Multiplexing and QoS Establishment**

23 2.8.1 Introduction

24 Tests in this section verify PDN multiplexing for multiple PDN with SO 59 and QoS

25 establishment with SO 64 or 67.

26 2.8.2 PDN Multiplexing on the Main Service Connection over SO 59

27 2.8.2.1 Definition

28 This test verifies that the AT inserts the PDN-ID to support PDN multiplexing when SO 59 is

29 used to carrying BE data for multiple PDN. Note, although the test procedure specifies IPv4

30 address allocation the test may be conducted with IPv6 address when supported by the

31 mobile station.

32 2.8.2.2 Traceability

33 [3]

34 Section 4.5 Protocol Stacks

1	Section 5.5.1	The EPS Bearer with PMIP-based S2a and eHRPD Access
2	Section 6.4.1	S2a Connection Establishment with the Default PDN
3	Section 10	Interface between the HSGW and the UE
4	Section 10.1	Main service connection between UE and HSGW
5	Section 10.1.3	PPP-Based Main Service Connection
6	Section 10.1.5	3GPP2 Vendor Specific Network Protocol (VSNP) Packet
7		Format
8	Section 10.2	Auxiliary service connections between UE and HSGW
9	[2]	
10	Section 3.1	Additional Requirements to Support eHRPD operation

### 11 2.8.2.3 Test Procedure

- 12 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
13 unavailable to the AT.
- 14 b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4  
15 address.
- 16 c. Ensure that the AT does not have an IPv4 address assigned from the HSGW. Note,  
17 this step may require HSGW to send a PPP VSNCP Terminate-Request.
- 18 d. If the AT has an open session with the AN, instruct the RAN to send a *SessionClose*  
19 message to the AT and ensure that the AT sends a *SessionClose* message to the  
20 RAN.
- 21 e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
22 provisioned.
- 23 f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the  
24 session negotiation is successful.
- 25 g. Cause the AT to start the PPP session establishment. This can be triggered by  
26 starting an application that requires data transmission by the AT.
- 27 h. Ensure that the AT has been successfully authenticated and the HSGW sends an  
28 EAP-Success message to the AT.
- 29 i. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing  
30 the PDN-ID selected by the AT.
- 31 j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
32 containing the IPv4 address and PDN-ID.
- 33 k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
34 PDN-ID to the AT.
- 35 l. Ensure that the AT sends a VSNCP-Configure-Ack message containing PDN-ID to  
36 the HSGW.

- 1 m. Verify that the AT can send and receive data for the assigned IPv4 address using the  
2 PDN-ID used in step i.
- 3 n. Verify that for the BE traffic being sent for the default PDN connection the AT places  
4 the PDN-ID used in step i in the VSNP header and that the AT sends data using RLP  
5 Flow Id 0.
- 6 o. Activate an application at the AT that requires connectivity with an additional PDN.  
7 If the AT supports IPv4 and IPv6, then a PDN that supports both IPv4 and IPv6  
8 should be used.
- 9 p. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the  
10 following fields:
- 11 1) PDN-ID  
12 2) Access Point Name (APN)  
13 3) PDN Type  
14 4) PDN Address  
15 5) Protocol Configuration Options  
16 6) Attach Type = Initial
- 17 If the AT supports both IPv4 and IPv6, verify that the PDN type = 3 (IPv4v6) is  
18 included in the request.
- 19 q. Verify that the PDN-ID included in PPP: VSNCP-Configure-Request message is  
20 different than the one used in step i.
- 21 r. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
22 containing the IPv4 address and the PDN-ID. If the AT included PDN type = 3 in the  
23 PPP: VSNCP-Configure-Request message in step p, ensure that the HSGW also  
24 includes an IPv6 Interface Identifier in the PDN address field.
- 25 s. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
26 the PDN-ID to the AT.
- 27 t. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to  
28 the HSGW.
- 29 u. Verify that the AT can send and receive data for the assigned IPv4 address using the  
30 PDN-ID used in step p.
- 31 v. If the HSGW included an IPv6 Interface Identifier in the PPP: VSNCP-Configure-Ack  
32 message in step r, ensure that the AT receives a Router Advertisement message from  
33 the HSGW. Note the AT may send a Router Solicitation message to the HSGW.
- 34 w. Verify that for the BE traffic being sent for the non-default PDN connection the AT  
35 places the PDN-ID sent in step r in the VSNP header and that the AT sends data  
36 using RLP Flow Id 0. If the AT received dual IP address assignment from the non-  
37 default PDN, verify the BE transfer for both IPv4 and IPv6 addresses.

1 2.8.2.4 Minimum Standard

2 The AT shall comply with steps m, n, p, q, u, and w.

3 2.8.3 PDN Multiplexing on Auxiliary Service Connection over SO 72

4 2.8.3.1 Definition

5 This test verifies that the AT inserts the PDN-ID to support PDN multiplexing when SO 72 is  
6 used for carrying BE data (0xFF and 0xFE) for multiple PDN. Note, although the test  
7 procedure specifies IPv4 address allocation the test may be conducted with IPv6 address  
8 when supported by the mobile station. Support for this test is optional at the ATs.

9 2.8.3.2 Traceability:

10 [3]

11	Section 4.5	Protocol Stacks
12	Section 5.5.1	The EPS Bearer with PMIP-based S2a and eHRPD Access
13	Section 6.4.1	S2a Connection Establishment with the Default PDN
14	Section 10	Interface between the HSGW and the UE
15	Section 10.1	Main service connection between UE and HSGW
16	Section 10.1.3	PPP-Based Main Service Connection
17	Section 10.1.5	3GPP2 Vendor Specific Network Protocol (VSNP) Packet
18		Format
19	Section 10.2	Auxiliary service connections between UE and HSGW

20 [2]

21	Section 3.1	Additional Requirements to Support eHRPD operation
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22 2.8.3.3 Test Procedure

- 23 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
24 unavailable to the AT.
- 25 b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4  
26 address.
- 27 c. Ensure that the AT does not have an IPv4 address assigned from the network. Note,  
28 this step may require HSGW to send a PPP VSNCP Terminate-Request.
- 29 d. If the AT has an open session with the RAN, instruct the RAN to send a  
30 *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*  
31 message to the AN.
- 32 e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
33 provisioned.

- 1 f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the  
2 session negotiation is successful.
- 3 g. Ensure that during session negotiation the AT includes a value of 0x07 and 0x08 for  
4 the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute  
5 of EMPA.
- 6 h. Ensure that during session negotiation the RAN proposes a value of 0x08 for the  
7 ProtocolID field of the FlowNNFlowProtocolParametersFwd and  
8 FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to  
9 ReservationLabel 0xFE. Ensure that the link flow NN is active.
- 10 i. Configure the HSGW to establish flow 0xFE on a PDN-Mux auxiliary A10 as SO 72.
- 11 j. Cause the AT to start the PPP session establishment. This can be triggered by  
12 starting an application that requires data transmission by the AT.
- 13 k. Ensure that the AT has been successfully authenticated and the HSGW sends an  
14 EAP-Success message to the AT.
- 15 l. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing  
16 the PDN-ID used by the AT.
- 17 m. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
18 containing the IPv4 address and the PDN-ID.
- 19 n. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
20 the PDN-ID to the AT. The value of the PDN-ID is copied from step l.
- 21 o. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID  
22 to the HSGW.
- 23 p. Verify that the AT can send and receive BE packet stream data for the assigned IPv4  
24 address using the PDN-ID assigned by the AT in step l.
- 25 q. Verify that for the packet stream BE traffic being sent for the default PDN  
26 connection the AT places the PDN-ID received in step n in the extra octet ahead of IP  
27 packet and that the AT sends packet stream data (0xFE) using RLP Flow Id NN used  
28 in step h.
- 29 r. Activate an application at the AT that requires connectivity with an additional PDN.
- 30 s. Ensure that the AT sends PPP: VSNCP-Configure-Request message containing the  
31 following fields:
  - 32 1) PDN-ID
  - 33 2) Access Point Name (APN)
  - 34 3) PDN Type
  - 35 4) PDN Address
  - 36 5) Protocol Configuration Options
  - 37 6) Attach Type = Initial

- 1 t. Ensure that the PDN-ID included in PPP: VSNCP-Configure-Request message is  
2 different than the one used in l.
- 3 u. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
4 containing the IPv4 address and the PDN-ID.
- 5 v. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
6 the PDN-ID to the AT.
- 7 w. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID  
8 to the HSGW.
- 9 x. Verify that the AT can send and receive data for the assigned IPv4 address using the  
10 PDN-ID used by the PDN-GW in step t.
- 11 y. Verify that for the octet and packet stream BE traffic being sent for the non-default  
12 PDN connection the AT places the PDN-ID received in step v in the VSNP header and  
13 that the AT sends octet stream data (0xFF) using RLP Flow Id 0.

#### 14 2.8.3.4 Minimum Standard

15 The AT shall comply with steps p, q, and y.

#### 16 2.8.4 QoS Establishment and PDN ID over SO 64 or SO 67

##### 17 2.8.4.1 Definition

18 This test verifies AT initiated QoS establishment and the PDN ID insertion in upper 4 bits of  
19 the ReservationLabel when SO 64 or SO 67 is used.

##### 20 2.8.4.2 Traceability

21 [3]

22	Section 4.5	Protocol Stacks
23	Section 5.5.1	The EPS Bearer with PMIP-based S2a and eHRPD Access
24	Section 6.4.1	S2a Connection Establishment with the Default PDN
25	Section 10	Interface between the HSGW and the UE
26	Section 10.1	Main service connection between UE and HSGW
27	Section 10.1.3	PPP-Based Main Service Connection
28	Section 10.1.5	3GPP2 Vendor Specific Network Protocol (VSNP) Packet
29		Format
30	Section 10.2	Auxiliary service connections between UE and HSGW
31	Section 5.5	Quality of Service
32	Section 5.5.4	UE Initiated Dedicated Bearer Procedures for eHRPD
33	Section 5.5.4.1.1	UE Requested Bearer Resource Allocation

- 1           Section 5.6.6                   Mapping of QoS parameters between 3GPP and 3GPP2
- 2   [2]
- 3           Section 3.1                   Additional Requirements to Support eHRPD operation
- 4   2.8.4.3 Test Procedure
- 5           a. Ensure that eHRPD system is available to the AT and E-UTRAN system is
- 6           unavailable to the AT.
- 7           b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4
- 8           address.
- 9           c. Ensure that the AT does not have an IPv4 address assigned from the network. Note,
- 10           this step may require HSGW to send a PPP VSNCP Terminate-Request.
- 11           d. If the AT has an open session with the RAN, instruct the RAN to send a
- 12           *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*
- 13           message to the RAN.
- 14           e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)
- 15           provisioned.
- 16           f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the
- 17           session negotiation is successful.
- 18           g. Cause the AT to start the PPP session establishment. This can be triggered by
- 19           starting an application that requires data transmission by the AT.
- 20           h. Ensure that the AT has been successfully authenticated and the HSGW sends an
- 21           EAP-Success message to the AT.
- 22           i. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing
- 23           the PDN-ID selected by the AT.
- 24           j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT
- 25           containing the IPv4 address and the PDN-ID.
- 26           k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing
- 27           the PDN-ID to the AT The value of the PDN-ID is copied from step i.
- 28           l. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID
- 29           to the HSGW.
- 30           m. Verify that the AT can send and receive data for the assigned IPv4 address using the
- 31           PDN-ID requested by the AT in step i.
- 32           n. Verify that for the BE traffic being sent for the default PDN connection the AT places
- 33           the PDN-ID received in step k in the VSNP header and that the AT sends data using
- 34           RLP Flow Id 0.
- 35           o. Activate an application at the AT that requires connectivity with an additional PDN
- 36           and QoS.

- 1 p. If the application in step o requested connectivity with the non-default PDN, ensure  
2 that the AT sends PPP: VSNCP-Configure-Request message containing the following  
3 fields:
- 4 1) PDN-ID
  - 5 2) Access Point Name (APN)
  - 6 3) PDN Type
  - 7 4) PDN Address
  - 8 5) Protocol Configuration Options
  - 9 6) Attach Type = Initial
- 10 q. If the application in step o requested connectivity with the non-default PDN, ensure  
11 that the PDN-ID included in PPP: VSNCP-Configure-Request message is different  
12 than the one used in step i.
- 13 r. If the application in step o requested connectivity with the non-default PDN, ensure  
14 that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing  
15 the IPv4 address and the PDN-ID.
- 16 s. If the application in step o requested connectivity with the non-default PDN, ensure  
17 that the HSGW sends a PPP: VSNCP-Configure-Request message containing the  
18 PDN-ID to the AT.
- 19 t. If the application in step o requested connectivity with the non-default PDN, ensure  
20 that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the  
21 HSGW.
- 22 u. Verify that the AT sends a VSNP: Resv message and includes the PDN-ID to which  
23 the QoS application needs to connect. Verify that the AT includes the ProfileID list,  
24 TFT, Opcode= QoS-Check, and a transaction ID in the Resv message.
- 25 v. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set  
26 to 'QoS Check Confirm' and includes the TFT and the authorized R-QoS-Sub-BLOB  
27 and the TransactionID that was sent in the Resv message.
- 28 w. Ensure that the RAN and AT activate the forward and reverse link flows to which the  
29 reservation is mapped.
- 30 x. Verify that the AT sends a VSNP: Resv message and includes the TFT, Flow ID, and  
31 the transaction ID that is different than the one used in step u.
- 32 y. Ensure that the HSGW sends a ResvConf message.
- 33 z. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not  
34 on.
- 35 aa. Verify that the AT sends and receives the data for the QoS Flow and inserts the  
36 PDN-ID in the upper 4 bits of the ReservationLabel.

1 2.8.4.4 Minimum Standard

2 The AT shall comply with steps m, n, u, x, z, and aa.

3 2.8.5 QoS Establishment for Dual IP address (IPv4 and IPv6) assignment

4 2.8.5.1 Definition

5 This test verifies that when a PDN assigns dual IP addresses to an AT, applications with  
6 QoS requirements that use these addresses establish their own TFT filters.

7 2.8.5.2 Traceability:

8 [3]

9 Section 5.4.5.1 IPv4 Address Allocation during PDN Connection  
10 Establishment

11 Section 5.4.5.4 IPv6 Address Allocation

12 Section 10.1.4.1 3GPP2 VSNCP Configuration Options

13 Section 10.1.4.2 3GPP2 VSNCP Configure-Request

14 Section 10.1.4.3 3GPP2 VSNCP Configure-Ack

15 Section 10.1.4.6 3GPP2 VSNCP Terminate-Request

16 Section 10.1.4.7 3GPP2 VSNCP Terminate-Ack

17 2.8.5.3 Test Procedure

18 a. Ensure that eHRPD system is available to the AT and E-UTRAN system is  
19 unavailable to the AT.

20 b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4  
21 address.

22 c. Ensure that the AT does not have an IPv4 address assigned from the network. Note,  
23 this step may require HSGW to send a PPP VSNCP Terminate-Request.

24 d. If the AT has an open session with the RAN, instruct the RAN to send a  
25 *SessionClose* message to the AT and ensure that the AT sends a *SessionClose*  
26 message to the RAN.

27 e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys)  
28 provisioned.

29 f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the  
30 session negotiation is successful.

31 g. Cause the AT to start the PPP session establishment. This can be triggered by  
32 starting an application (IPv4 based application) that requires data transmission by  
33 the AT. Ensure that the application supports IPv4 address, has QoS requirements  
34 that will trigger a Resv message (see step o below).

- 1 h. Ensure that the AT has been successfully authenticated and the HSGW sends an  
2 EAP-Success message to the AT.
- 3 i. Ensure that the AT sends PPP: VSNCP-Configure-Request message containing the  
4 following fields:
  - 5 1) PDN Address = 0
  - 6 2) IPv4 Default Router Address= 0.0.0.0
  - 7 3) Attach Type = Initial
  - 8 4) PDN-ID
  - 9 5) PDN type = 3.
- 10 j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT  
11 containing the PDN-ID, and IPv4 address as well as the IPv6 Interface Identifier in  
12 the PDN address field.
- 13 k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing  
14 the PDN-ID to the AT.
- 15 l. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID  
16 to the HSGW.
- 17 m. If the AT does not receive Router Advertisement message from the HSGW, verify that  
18 the AT sends a Router Solicitation message to the HSGW.
- 19 n. Ensure that the HSGW sends a Router Advertisement message containing the IPv6  
20 home network prefix.
- 21 o. Verify that the AT sends a VSNP: Resv message and includes the PDN-ID to which  
22 the QoS application needs to connect. Verify that the AT includes the ProfileID list,  
23 TFT, Flow ID, Opcode= 'QoS Check', and a transaction ID in the Resv message.
- 24 p. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set  
25 to 'QoS Check Confirm' and includes the TFT and the authorized R-QoS-Sub-BLOB  
26 and the TransactionID that was sent in the Resv message.
- 27 q. Ensure that the RAN and AT activate the forward and reverse link flows to which the  
28 reservation is mapped.
- 29 r. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not  
30 on.
- 31 s. Start another application (IPv6 based application) that connects the the same PDN  
32 but uses IPv6 addresses.
- 33 t. Verify that the AT does not generate a VSNCP Configure Request for the IPv6 based  
34 application.
- 35 u. Verify that the AT sends a VSNP: Resv message and includes the ProfileID list, TFT,  
36 Flow ID, Opcode= 'QoS Check', and the transaction ID that is different than the one  
37 used in step o.

- 1 v. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set  
2 to 'QoS Check Confirm' and includes the TFT and the authorized R-QoS-Sub-BLOB  
3 and the TransactionID that was sent in the Resv message.
- 4 w. Ensure that the RAN and AT activate the forward and reverse link flows to which the  
5 reservation is mapped.
- 6 x. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not  
7 on.
- 8 y. Ensure that the AT can send and receive data for the assigned IPv4 and IPv6  
9 addresses using the PDN-ID used in step i.

10 2.8.5.4 Minimum Standard

11 The AT shall comply with steps o, r, t, u, and x.

## 3 End to End Application Tests

### 3.1 SMS origination and termination during active eHRPD session

#### 3.1.1 Introduction

Tests in this section verify successful SMS origination and termination during an active eHRPD session.

#### 3.1.2 SMS origination during active eHRPD session

##### 3.1.2.1 Definition

This test verifies an SMS message origination from an eHRPD capable AT is successful.

##### 3.1.2.2 Traceability

[2]

Section 3.1 Additional Requirement to support eHRPD operation

[4]

Section 2.4.1.1.1

##### 3.1.2.3 Test Procedure

- a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.
- b. Initiate an eHRPD packet data call from the AT on to RAN2.
- c. Keep the data call active by starting a suitable application.
- d. Instruct the AT to send an SMS message to RAN1 on the r-csch channel.
- e. Verify that the SMS message is correctly received at the SMS Message Center.
- f. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.
- g. Instruct the AT to send an SMS message to RAN1 on the r-dsch channel.
- h. Verify that the SMS message is correctly received at the SMS Message Center.
- i. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.

##### 3.1.2.4 Minimum Standard

The AT shall comply with steps e, f, h, and i.

RAN1 shall comply with steps e and h.

1 3.1.3 SMS termination during active eHRPD session

2 3.1.3.1 Definition

3 This test verifies an SMS message termination from an eHRPD capable AT is successful.

4 3.1.3.2 Traceability

5 [2]

6 Section 3.1 Additional Requirement to support eHRPD operation

7 [4]

8 Section 2.4.1.1.1

9 3.1.3.3 Test Procedure

- 10 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured  
11 as 1xRTT and RAN2 configured as eHRPD.
- 12 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 13 c. Keep the data call active by starting a suitable application.
- 14 d. Instruct RAN1 to send an SMS message to the AT on the f-csch channel.
- 15 e. Verify that the SMS message is correctly received at the AT.
- 16 f. Resume the application and verify that the AT establishes the connection on RAN2  
17 and does not attempt to negotiate a new PPP session.
- 18 g. Instruct the RAN1 to send an SMS message to the AT on the f-dsch channel.
- 19 h. Verify that the SMS message is correctly received at the AT.
- 20 i. Resume the application and verify that the AT establishes the connection on RAN2  
21 and does not attempt to negotiate a new PPP session.

22 3.1.3.4 Minimum Standard

23 The AT shall comply with steps e, f, h, and i.

24 **3.2 SMS origination and termination during dormant**  
25 **eHRPD session**

26 3.2.1 Introduction

27 Tests in this section verify successful SMS origination and termination during a dormant  
28 eHRPD session.

29 3.2.2 SMS origination during dormant eHRPD session

30 3.2.2.1 Definition

31 This test verifies an SMS message origination from an eHRPD capable AT is successful.

1 3.2.2.2 Traceability

2 [2]

3 Section 3.1 Additional Requirement to support eHRPD operation

4 [4]

5 Section 2.4.1.1.1

6 3.2.2.3 Test Procedure

- 7 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured  
8 as 1xRTT and RAN2 configured as eHRPD.
- 9 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 10 c. Wait for the AT connection to go dormant.
- 11 d. Instruct the AT to send an SMS message to the RAN1 on the r-csch channel.
- 12 e. Verify that the SMS message is correctly received at the SMS Message Center.
- 13 f. Verify that the PPP connection is not dropped and the AT is still in dormant state.  
14 Note, the dormant state may change as a result of background traffic that causes  
15 eHRPD connection to be established.
- 16 g. Resume the application and verify that the AT establishes the connection on RAN2  
17 and does not attempt to negotiate a new PPP session compared to the one in step b.
- 18 h. Wait for the AT connection to go dormant.
- 19 i. Instruct the AT to send an SMS message to the RAN1 on the r-dsch channel.
- 20 j. Verify that the SMS message is correctly received at the SMS Message Center.
- 21 k. Verify that the PPP connection is not dropped and the AT is still in dormant state.  
22 Note, the dormant state may change as a result of background traffic that causes  
23 eHRPD connection to be established.
- 24 l. Resume the application and verify that the AT establishes the connection on RAN2  
25 and does not attempt to negotiate a new PPP session compared to the one in step b.

26 3.2.2.4 Minimum Standard

27 The AT shall comply with steps e, f, j, k, and l.

28 3.2.3 SMS termination during dormant eHRPD session

29 3.2.3.1 Definition

30 This test verifies an SMS message termination from an eHRPD capable AT is successful.

31 3.2.3.2 Traceability

32 [2]

33 Section 3.1 Additional Requirement to support eHRPD operation

1 [4]

2 Section 2.4.1.1.1

3 3.2.3.3 Test Procedure

- 4 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured
- 5 as 1xRTT and RAN2 configured as eHRPD.
- 6 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 7 c. Wait for the AT connection to go dormant.
- 8 d. Instruct RAN1 to send an SMS message to the AT on the f-csch channel.
- 9 e. Verify that the SMS message is correctly received at the AT.
- 10 f. Verify that the PPP connection is not dropped and the AT is still in dormant state.
- 11 Note, the dormant state may change as a result of background traffic that causes
- 12 eHRPD connection to be established.
- 13 g. Start an application from the AT and verify traffic channel is correctly set up on
- 14 RAN2.
- 15 h. Wait for the AT connection to go dormant.
- 16 i. Instruct RAN1 to send an SMS message to the AT on the f-dsch channel.
- 17 j. Verify that the SMS message is correctly received at the AT.
- 18 k. Verify that the PPP connection is not dropped and the AT is still in dormant state.
- 19 Note, the dormant state may change as a result of background traffic that causes
- 20 eHRPD connection to be established.
- 21 l. Resume the application and verify that the AT establishes the connection on RAN2
- 22 and does not attempt to negotiate a new PPP session compared to the one in step b.

23 3.2.3.4 1.3.3 Minimum Standard

24 The AT shall comply with steps e, f, g, j, k, and l.

## 25 **3.3 Voice call origination and termination during active**

### 26 **eHRPD session**

27 3.3.1 Introduction

28 Tests in this section verify successful Voice call origination and termination during an

29 active eHRPD session.

30 3.3.2 Voice call origination during active eHRPD session

31 3.3.2.1 Definition

32 This test verifies Voice call origination from an eHRPD capable AT is successful.

## 1 3.3.2.2 Traceability

2 [2]

3 Section 3.1: Additional Requirement to support eHRPD operation

4 [6]

5 Chapter 7 Session Layer

6 Chapter 8 Connection Layer

7 Chapter 9 MAC Layer

## 8 3.3.2.3 Test Procedure

9 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured  
10 as 1xRTT and RAN2 configured as eHRPD.

11 b. Initiate an eHRPD packet data call from the AT on to RAN2.

12 c. Keep the data call active by starting a suitable data application.

13 d. Initiate a voice call from the AT to RAN1.

14 e. Verify that the voice call completes and verify CDMA user data in both directions.

15 f. End the voice call.

16 g. Resume the application and verify that the AT establishes the connection on RAN2  
17 and does not attempt to negotiate a new PPP session compared to the one in step b.

## 18 3.3.2.4 Minimum Standard

19 The AT shall comply with steps e and g.

20 The RANs shall comply with steps e and g.

## 21 3.3.3 Voice call termination during active eHRPD session

## 22 3.3.3.1 Definition

23 This test verifies Voice call termination from an eHRPD capable AT is successful.

## 24 3.3.3.2 Traceability

25 [2]

26 Section 3.1: Additional Requirement to support eHRPD operation

27 [6]

28 Chapter 7 Session Layer

29 Chapter 8 Connection Layer

30 Chapter 9 MAC Layer

1 3.3.3.3 Test Procedure

- 2 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured
- 3 as 1xRTT and RAN2 configured as eHRPD.
- 4 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 5 c. Keep the data call active by starting a suitable data application.
- 6 d. Initiate a voice call from RAN1 to the AT.
- 7 e. Verify that the voice call completes and verify CDMA user data in both directions.
- 8 f. End the voice call.
- 9 g. Resume the application and verify that the AT establishes the connection on RAN2
- 10 and does not attempt to negotiate a new PPP session compared to the one in step b.

11 3.3.3.4 Minimum Standard

12 The AT shall comply with steps e, and g.

13 RAN1 shall comply with step e.

14 RAN2 shall comply with step g.

15 **3.4 Voice call origination and termination during**

16 **dormant eHRPD session**

17 3.4.1 Introduction

18 Tests in this section verify successful Voice call origination and termination during a

19 dormant eHRPD session.

20 3.4.2 Voice call origination during dormant eHRPD session

21 3.4.2.1 Definition

22 This test verifies a Voice call origination from an eHRPD capable AT is successful.

23 3.4.2.2 Traceability

24 [2]

25 Section 3.1: Additional Requirement to support eHRPD operation

26 [6]

27 Chapter 7 Session Layer

28 Chapter 8 Connection Layer

29 Chapter 9 MAC Layer

### 1 3.4.2.3 Test Procedure

- 2 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured
- 3 as 1xRTT and RAN2 configured as eHRPD.
- 4 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 5 c. Wait for the AT connection to go dormant.
- 6 d. Initiate a voice call from the AT to RAN1.
- 7 e. Verify that the voice call completes and verify CDMA user data in both directions.
- 8 f. End the voice call.
- 9 g. Verify that the PPP connection to RAN2 is not dropped and the AT is still in dormant
- 10 state. Note, the dormant state may change as a result of background traffic that
- 11 causes eHRPD connection to be established.
- 12 h. Resume the application and verify that the AT establishes the connection on RAN2
- 13 and does not attempt to negotiate a new PPP session compared to the one in step b.

### 14 3.4.2.4 Minimum Standard

15 The AT shall comply with steps e, g, and h.

16 RAN1 shall comply with step e.

17 RAN2 shall comply with steps g and h.

### 18 3.4.3 Voice call termination during dormant eHRPD session

#### 19 3.4.3.1 Definition

20 This test verifies a Voice call termination from an eHRPD capable AT is successful.

#### 21 3.4.3.2 Traceability

22 [2]

23 Section 3.1: Additional Requirement to support eHRPD operation

24 [6]

25 Chapter 7 Session Layer

26 Chapter 8 Connection Layer

27 Chapter 9 MAC Layer

#### 28 3.4.3.3 Test Procedure

- 29 a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured
- 30 as 1xRTT and RAN2 configured as eHRPD.
- 31 b. Initiate an eHRPD packet data call from the AT on to RAN2.
- 32 c. Wait for the AT connection to go dormant.

- 1 d. Initiate a voice call from RAN1 to the AT.
- 2 e. Verify that the voice call completes and verify CDMA user data in both directions.
- 3 f. End the voice call.
- 4 g. Verify that the PPP connection to RAN2 is not dropped and the AT is still in dormant
- 5 state.
- 6 h. Start a data application from the AT and verify traffic channel is correctly set up on
- 7 RAN2.

8 3.4.3.4 Minimum Standard

9 The AT shall comply with steps e, g, and h.

10 RAN1 shall comply with step e.

11 RAN2 shall comply with steps g and h.